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MINNESOTA MEDICINE

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Volume 20 MAY, 1937 Number 5

FUNCTIONS OF THE SPLEEN AND THYMUS*

PROFESSOR LEON ASHER

Professor of Physiology, University of Berne

Berne, Switzerland

I FEEL deeply honored in having the opportunity of visiting American universities and American medical societies. It is an especial distinction that you allow a physiologist, a man who is said to be a man of gray theory, to speak before the medical profession. You extend invitations to us to speak on the basic sciences, showing thereby how much the American medical profession is interested in basic sciences and in the unity of all of us medical men.

The subject of my lecture is physiology of the spleen and thymus. Some years ago we knew nothing of the spleen and I will not speak about those dark times. Nevertheless there are special biological and anatomical aspects which ought to have led to our finding out the function of the spleen.

It has been known for a long time that the spleen has to do with the formation of white blood corpuscles, so we shall leave out the discussion of this function. Another very important function of the spleen was discovered by the brilliant researches of Sir Joseph Barcroft. He found that the spleen is a very important depot for blood. He showed through excellent experiments that under various conditions the spleen contracts and in consequence thereof puts out as much as 15 per cent of additional hemoglobin into the circulation. When the body needs more oxygen, the spleen contracts and more hemoglobin is at the disposal of the body.

This has been shown in the dog which anatomically has a spleen with contractile substance. It is a question whether the human spleen has so much contractile substance. Notwithstanding a certain anatomical difference the physiological facts show that the spleen of the human acts just as much as a depot for blood corpuscles as the spleen of the cat and the dog. Under conditions which cause contraction of the spleen, the amount of hemoglobin and the amount of blood corpuscles will run up.

There is another relationship of the spleen to which we are led when we study the chemistry of the spleen. It has been known for a very long time that the spleen contains relatively more iron than any other tissue of the animal body. That must have some significance and an investigator may raise the question whether the spleen may have something to do with iron metabolism. For instance, the spleen might store up iron for use on occasions when the animal body requires more iron. Of course one must never forget that in the animal body the spleen is not the only place where iron is deposited. Every cell has a very small amount of iron, and this small amount is necessary as a catalyzer. We know through the splendid researches of Warburg that iron is necessary for the oxidizing enzyme.

If you want to investigate the iron metabolism of animals, and especially of small animals, you must use very exact apparatus. The principle thing is to safeguard your experiments so that no contamination of iron occurs from the animal's environment. The cage in which the animals are kept should be made out of glass and the animals rest on a perforated plate of glass.

Several years ago we found that when we took out a dog's spleen, the output of iron in the feces was very much greater than in normal dogs. The feces have to be analyzed, because by way of the kidney only very little iron leaves the animal body.

*Read before the Minnesota State Medical Association, Rochester, Minn., May 4, 1936.

Our findings were corroborated by working on the human being. Experiments done in the surgical clinic of the University of Bonn on patients whose spleen had to be removed, showed that there was a greater loss of iron after the removal of the spleen. But other important researches, for instance those by Krumbhaar and Pearce in your country, could not corroborate these facts. After taking out the spleen, they found there was not much difference in excretion of iron. I have had the satisfaction to learn that in a more recent paper which appeared about a year ago, they state that they have found cases in which after taking out the spleen there was a larger excretion of iron.

When, in experiments, one man finds one thing and the other finds the opposite, there are various possibilities. The one man can be right, the other man can be right, or both can be wrong. But I am rather a peaceful man, and I suggest that perhaps both are right, those with negative and those with positive findings. The difference must lie in the conditions, and we were able to find those conditions.

The extirpation of the spleen is not followed by significant changes in the animal body. Extirpation of the spleen from a very young animal has no apparent influence at all. The animal will grow just the same as a normal animal. There is no difference to be observed in muscular activities and the outer appearance of vegetative life is unaltered. One must use special experiments to reveal any difference.

What may be the cause of the lack of symptoms? One possibility is that there exists a compensating mechanism, that very easily the deficiency of the iron metabolism and perhaps also of other functions related to the spleen, known and unknown, are compensated. It might be in the first place that deposits of iron exist in other tissues also. Or it might be that in consequence of the loss of the system of cells in the spleen, the reticulo-endothelial cells in other tissues compensate either by increasing or diminishing their functional capacity. In experiments destined to solve the question of compensation, anemia must be avoided, as anemia is apt to stimulate alterations of function.

Guinea pigs are examples of animals which after splenectomy fail to become anemic. If splenectomy is made by a cautious operation without any bleeding, and afterwards the animal is well fed, the amount of hemoglobin and the amount of blood corpuscles will be exactly the same with or without the spleen. If you take a series of normal guinea pigs and analyze the amount of iron in the liver, a rather constant percentage of iron is found. But a short time after taking out the spleen one finds that the percentage of iron in the liver has risen very much. In the liver of a normal guinea pig the average value of iron is 0.056 per cent. Three days after taking out the spleen the average value instead of being 0.056 per cent will have risen to 0.09 per cent. There is, therefore, a large increase of the iron content of the liver. The liver being a very large tissue, consequently a very much larger amount of iron is stored up in the liver and you have a complete compensation for the deficiency of the spleen.

These experiments seemed to be very convincing, but of course as soon as you find results exactly as you wish to have them, you must be very careful. So we tried to control our experiments by a different procedure. We said if our conclusion is correct that deficiency of the spleen is compensated by the liver, then one should have an increased output of iron if one were able to abolish or diminish the compensating power of the liver. This is achieved comparatively simply. We know that one can blocade the reticulo-endothelial system by injecting into the living animal an ink or carbon preparation. Injection of a very fine charcoal preparation does not cause any disturbance of the normal animal as we had observed in controls. Extirpation of the spleen of the guinea pig leads sometimes to a large increase and sometimes to a small increase of iron excretion. Afterwards compensation occurs and the excretion of iron may be exactly the same as before. One may even observe (a point of interest) less excretion than before taking out the spleen. When one has awakened the compensatory capacity of the animal body, one meets with an overshooting, the tissues with compensating capacity doing even more than before. But as soon as we blockade the reticulo-endothelial system up runs the excretion of iron. This experiment decisively proves that splenectomy will let the body lose more iron, if one gets rid of the compensatory function of the reticulo-endothelial cells of the liver. By post-mortem examination the success of blockading must be

verified. In microscopic slides the reticulo-endothelial cells are densely filled with charcoal.

I hope that the preceding experiments have demonstrated that one of the functions of the spleen is the regulation of iron metabolism, that the spleen retains a certain amount of iron, stores it up and gives it up when necessary to the cells of the animal body for use.

We will now turn to quite a different function of the spleen, a function which I think is of great clinical importance, and that is the relationship of the spleen to the function of the bone marrow. I don't like to be a historian and shall not discuss the experiments conducted in my institution many years ago, but prefer to speak of a series of recent experiments by which, as we believe, we have demonstrated that the spleen has an inhibitory action on the function of the bone marrow.

What does that mean? That means the following: We come to an understanding of inhibition by applying a fundamental principle of general physiology. Every tissue of the animal body without exception has its autonomic functions. Tissues are able to do their work to a certain degree and within certain limits without any relation to other parts of the animal body. But in the animal body they must be regulated to do more and, according to circumstances, to do less. In part this is the function of the central nervous system by aid of augmentory and inhibitory nerves. The same principle holds good for hormonic control. We have hormones or chemical control in an augmentory, and chemical control in an inhibitory sense. The spleen exerts an inhibitory influence on bone marrow.

To review a few more recent experiments performed in my institution, I will begin with the following experiment. We know that if one injects a 1 or 2 per cent solution of nucleic acid, for instance into a rabbit, a short time after we shall have a production of very many more leukocytes. After splenectomy, injection of the same amount of nucleic acid will cause a much larger increase of leukocytes.

Now we will pass over to another experiment. We begin with a series of normal animals and inject a 2 per cent nucleic acid solution. We carefully measure the rise of white blood corpuscles. After that we take out the thyroid. Now we find that the same amount of nucleic acid injection will cause no change at all. Consequently there you have the reverse of that following splenectomy. The thyroid is a gland which doubtlessly activates bone marrow and has an augmentory influence. We then proceeded to perform splenectomy on the animals without thyroid. To our astonishment (we didn't believe it would come out so beautifully) the result was that the animals with the double operation behaved like normal ones. Taking out the thyroid and the spleen produced an equilibrium. Let us survey the facts to understand the meaning of this equilibrium. Taking out the thyroid has an inhibitory influence on the bone marrow, because the thyroid acts in an augmentory sense. When we take out the spleen we have removed an inhibitory influence. Consequently the bone marrow can be more active than before.

I shouldn't doubt but that many of you will say "This man is very fantastic; that cannot be true." Well, we had the same criticism of ourselves, so we said to ourselves, "We will send all the bone marrow of the animals we have operated on to our friend the pathological anatomist. The pathological anatomist is a man far more serious than a physiologist. A physiologist likes poetry. The pathological anatomist (I hope there is no pathological anatomist in the audience who is by chance a poet) is much less of a poet than we are. Consequently we sent these preparations to our friend the pathological anatomist. He was not informed what had happened but simply received the bone marrow specimens with numbers. What did Professor Wegelin of Berne University, a well known pathologist, known to all of those who have studied the thyroid gland, find? In animals without thyroids, he found evidence which was very clear cut, of greatly diminished activity of the bone marrow, and in animals without the spleen he found signs of increased activity. In animals without either thyroid or spleen, he found the histological picture was exactly or nearly exactly similar to that of the normal animal.

We will now proceed to a new series of experiments, again showing that the spleen has an inhibitory influence on bone marrow. We know from various sources, especially from pediatricians, that if animals are fed with goat's milk an experimental anemia is produced. One can investigate these anemias by either counting the blood corpuscles or by estimating the amount of

hemoglobin in the blood. For instance, if you feed rabbits goat's milk, very soon a very severe anemia will be produced. But if after one has restored the animals from their anemia, the spleen is removed and the feeding with goat's milk is repeated there is still a diminution of hemoglobin, but much less than in the normal animal. What does that mean? By taking out the spleen we have removed a physiological inhibitory influence on bone marrow. Consequently the animal will be more resistant to the harmful effect of feeding it with goat's milk.

All these experiments I think prove my point. They prove that the spleen has an inhibitory influence on bone marrow.

About a week and a half ago, I enjoyed the opportunity of staying at the Ohio State University in Columbus, and visiting my friend and pupil Professor Curtis, who did important research work on the action of diuretic substances in my institution. He has demonstrated some highly suggestive experiments on human beings. He showed me patients in whom he had taken out the spleen on the theory that the spleen has an inhibitory influence on bone marrow and his therapeutic results were absolutely in accord with this theory. I have no doubt that in your country with your splendid surgery and your splendid medical clinics, you will very often meet cases where you will do good by removing the spleen and thus bettering the condition of the patient. Of course, if the result is not the expected one, you must not blame the physiologist if you have performed the operation under a wrong diagnosis. For that we are not answerable.

I have been speaking of the spleen as the tissue which has an inhibitory regulating influence on bone marrow, but you can show it also to have a regulating inhibitory influence on other functions. Everywhere, where the thyroid gland is augmentory, the spleen is inhibitory. One especially clear case where this inhibitory regulating influence comes in, is the sensitivity of the central nervous system. We chose the respiratory center because its sensitivity can be tested by exact quantitative methods. The principle of the quantitative method is to let an animal inspire air with various tensions of CO_2 and to measure the minute volume of respiration; first street air, then air containing so much CO_2 that it has 20 millimeter tension and then air with so much CO_2 that it has 40 millimeter tension. Since the classical work of Haldane it has been known that CO_2 in the air and in the blood will increase respiration. We can measure the minute volume of respiration very easily. If one studies normal animals for a length of time, one ascertains exactly their response to CO_2 stimulation. Into animals standardized in this way we inject a substance which has been produced by the spleen. We have not as yet a chemically isolated substance from the spleen, but we are able to use a fairly good preparation made by the German internist Schliephake. Injection of this preparation after a certain lapse of time causes the respiratory center to respond much less to a given CO_2 tension. The result is exactly the reverse if we inject thyroxin, because this hormone raises the excitability of the respiratory center.

These experiments have added a new proof of the inhibitory influence of the spleen. It has an inhibitory influence on various functions, while the thyroid is augmentory. These two tissues are part of the big regulating system, one regulating in one sense and the other in the opposite sense. To call this, as one often does, an antagonism is in a biological sense not correct. Only as to symptoms there is an apparent antagonism. In reality every augmentory and inhibitory effect in the animal body acts together in a physiological way and is in harmony with the ends at which the organism tends to arrive.

Let me now in the short time left speak to you on the function of the thymus. I am glad to have an opportunity of giving a brief review of the function of the thymus, because some splendid work has been done in your country by Rowntree, some years after the work done at the Berne institution.

When research work was first begun on the thymus gland, the first thought was that it might have something to do with growth. If it is true that the first love is the best, we ought to return to our first love; in the case of the thymus we do so by returning to the first idea of its having a growth promoting function.

Modern physiology of the thymus begins with the beautiful researches of Basch, Matti, Klose and Vogt, who took out the thymus in quite young animals and found growth was inhibited. This seemed to settle the matter, but then came other papers, outstanding among these being that

of Parker and McClure who did not find the slightest difference in growth. I once more repeat my phrase: One side may be right, the other may be right or both may be wrong. Those who observed retardation of growth objected that the negative results were due to subtotal removal of the thymus while their opponents explained the apparent positive results as due to kennel effects: lack of movement, light and air. The latter explanation is certainly wrong for the positive observations of Matti, because his experiments were conducted during the summer term and the puppies spent a great deal of time in the garden of the Berne Physiological Institution. I remember the very alert puppies playing with children in the garden. Besides, other operations on laboratory dogs, for instance extirpation of the spleen, do not cause retardation of growth.

Nevertheless the question remains how to explain the divergence of observations. We believe we have found the experimental factor which decides whether thymectomy leads to retardation of growth or not. It is the way one feeds the animals. In their paper Parker and McClure state that their dogs were fed with milk and cream, besides other food. This nourishment contained very ample amounts of growth vitamins, so that pharmacologically they wiped out the effect of the lack of the less potent substance in the thymus. That everything depends on how much vitamins the food contains is revealed by appropriate experiments. We will prove what I said. One must take a series of animals and feed them just as little vitamins as possible, just enough for growth. A certain minimum amount is necessary, else growth stops. Our first experiments were conducted on quite young rats. The controls received a diet which in calories and vitamins contained just the sufficient amount for daily slow growth. The experimental animals were given the same nourishment and were injected daily with a substance, which we prepared from thymus about five years ago and called thymocrescin. One milligram per day is sufficient to promote active growth. Thymocrescin is free from protein and lipoids and gives the reactions of peptides. It has a specific action not possessed by extracts of lymphatic glands on muscles prepared in the same way as thymocrescin, nor do large doses of the total amino acids of meat have a like effect on growth as thymocrescin.

Knowing the fact that one has to safeguard against overdosage of vitamins, we proceeded to re-examine the question of effect of thymectomy. Employing rats, the operation was performed by going deep down into the chest under guidance of bright light to remove every trace of the thymus. Besides normal controls, control animals, in which the whole operation was performed but without extirpation of the thymus were used. All animals were fed with lean meat, a food sufficient for slow growth, but without the abundance of vitamins to compensate for the lack of thymocrescin. Both control series grew equally well, showing that the severe operation on very young animals had no growth-retarding effect. But the growth curve of the animals without thymus demonstrated marked retardation.

A histologic investigation of the epiphyseal growth zone of bone showed that in the animals without a thymus and fed with lean meat, this zone was much less developed than in the normal and the operated rats similarly fed. The picture is not that of rickets but of simply retarded growth.

I will now draw the conclusion. One of the functions of the thymus (it may have others) is regulation of growth. But this lack of regulation only appears if either there are certain diseases (pathology I must leave to my medical friends) or if the food does not contain enough vitamins.

It has been a very great pleasure and privilege to have been enabled to lecture before your most distinguished Minnesota State Medical Association. I hope that, in the short time I have had the honor of being before you, you may have received the impression that there is a unity between us, and for us visitors not to feel this unity is impossible because we are overwhelmed by your splendid hospitality.

INTERPROFESSIONAL RELATIONS—IS THERE A POLICY?*

CHARLES H. ROGERS, Ph.B., Ph.C., Sc.D.
Dean of College of Pharmacy, University of Minnesota
Minneapolis, Minnesota

I WOULD like to discuss with you, for a short time, the subject of interprofessional relations among practitioners in the health sciences. That pleasant and mutually profitable relationships between men and women engaged in these respective science fields would result in a better understanding of one another's problems and would contribute to a more efficient service to those who are sick, may, I believe, be assumed. How these results can be best obtained is a controversial subject upon which many pharmacists, physicians, dentists, and nurses, have expressed their opinions. If the ideas embodied in all of these opinions were incorporated into a single statement of policy, more than likely it would not be understandable to anyone. Those who have the conviction that some policy is desirable for the good of medical service to the public have never attempted to formulate the fundamental and basic principles of all of these suggestions into a concise and understandable statement of policy. I think that most practitioners are unanimously of the opinion there does exist some sort of vague understanding among these professions but they have felt the lack of some definitely expressed formula to guide them. From time to time, some members of our fraternity have implied that special activity in interprofessional relationships by members of any particular group of the health sciences, is motivated either by a desire for personal gain or for aggrandizement. To me such implications signify that those who are bold enough to make these suggestions are totally ignorant of the altruistic motives actuating such endeavors. Surely, it cannot be that they are tacitly subscribing to procedures which they seem to condemn. To avoid misconception, I would suggest the reading of an article by Mr. H. H. Gregg, Jr., entitled: "Interprofessional Relations between Physicians and Pharmacists as Carried on in Minnesota," published in the November 1932 issue of the *Journal of the American Pharmaceutical Association.* Here the motives that stimulated our own Interprofessional Relationships Committee are concisely stated as follows: "In our efforts, we have tried to be constructive. We have tried to keep uppermost in our minds at all times, the *welfare of the patient;* and further to be helpful to physician, dentist, and pharmacist." By this and other frank statements will the reader acquire a greater appreciation of the fine work that has been done in this state during the past seven years and also be made fully cognizant of the fact that nothing but altruistic motives inspired some of our most prominent men in medicine, dentistry, and pharmacy, to become leaders in this particular type of interprofessional work. The activities of the Interprofessional Relationships Committee have been conducted on a high plane and in accordance with well-laid plans formulated especially for improving medical service to the patient.

Interprofessional relations imply a mutual and also reciprocal interest on the part of the practitioners of several professions. Any policy pertaining to interprofessional relations, regardless of whether inferred or definitely expressed, must be founded upon at least one sociological condition, namely, that it must accrue to the common good of all. Any policy or principle formulated for the expressed purpose of benefiting a particular group or clique, is unsound and will not survive the test of time. If, on the other hand, those who are charged with the formulation of policies and principles, are motivated with the desire to benefit mankind in general, the product of their endeavors will react reciprocally so as to benefit those who promulgate them. Permit me to illustrate my point by the use of chemical nomenclature. If our human reaction-mixture consists of qualified practitioners plus sound principles and policies, there will be produced high ideas plus better medical service to all patients. If we assume that the functional principles and policies are sound, they then will be-

*Presented before the Hennepin County Medical Society, Minneapolis, Minn., March 17, 1937.

come constants in what we will call the socio-professional equation and the reaction will inevitably be a reversible one.

History teaches us that all documents, constitutions, and precepts that have endured, were devised by men who, by training and experience, were qualified to conceive of great things. Any policy on interprofessional relations affects all practitioners in the respective fields of the health sciences, and, therefore, it should be formulated by representative men and women of each profession who not only recognize the professional, economic, and sociological problems of their own group but also are appreciative of the same type of problems in the others. They must understand that the ideal health service to the patient involves a perfect coördination of all health groups in whose functioning no particular member is paramount to or independent of the others. It is not beyond our imaginations to conceive that several centuries ago there were individuals who were not only skilled in the recognition and treatment of diseases but were also proficient in the extraction of teeth, in the compounding of medicines, and even in nursing the sick. Certainly, Francois Gilead, the first apothecary to come to this country in 1535, or Dr. Thomas Wooton, the first physician to be sent by The London Company to participate in the founding of Jamestown, Virginia, were not restricted by professional ethics or by law in so far as the scope of their usefulness to the sick was concerned. It was not until some years later that the American Colonies enacted statutes; *i.e.*, the Virginia Act in 1736; South Carolina Statute in 1751, and others, all of which were attempts at professional differentiation. In this connection, some of the statements included in the proclamation (in French) regulating the practice of surgery made by Don Alexandre O'Reilly, who was the Spanish Governor of Louisiana in 1770, may be of interest to you:

"Medicine embraces three parts, namely: medicine proper, which is the science of recognizing diseases, and the relation which they have with remedies, and the prescribing of the latter with the diet. The other two parts, which are surgery and pharmacy, are its attendants and have their special fields. Surgery includes the use, in general, of the hands and of external remedies. Pharmacy is concerned, generally speaking, with the preparation of remedies."

In 1765, Dr. John Morgan founded the first medical school attached to any college or university in this country—the Medical School of the College of Philadelphia, which, as you all know, was combined, in 1791, with the Medical Department of the University of Pennsylvania to form the present University of Pennsylvania. During this period this eminent man was aided and encouraged by none other than Benjamin Franklin in his attempt to gain recognition for pharmacy as a specific field of endeavor.

During the last one hundred and sixty-seven years, these arts have developed with increasing rapidity into sciences until today those practitioners who are enlightened upon professional advances in fields other than their chosen one, recognize them as highly developed specialties and claim no proficiency or moral right to practice them. A review of the history of medicine and pharmacy for four thousand years also brings us to the conclusion that medicine and pharmacy are definitely specialized departments of the health sciences and that they are separately interdependent. The practitioners of pharmacy, like those who practice medicine, dentistry, and nursing, are qualified by training and experience to participate in the drafting of a policy of interprofessional relations.

Because of the invasion of commercialism in the drug business, not an inconsiderable number of laymen and physicians are skeptical not only of the professional capabilities of the pharmacist but also of the value of the health service that he is daily rendering to them. Careful scrutiny will show that today commercialism has penetrated, to a greater or less degree, nearly all of the professions, however dignified and honorable. It has been said that the only difference between pharmacy and some of the others is that pharmacy displays its "dirty linen" in show windows whereas others keep theirs in a dark closet. Be that as it may, it is my privilege today, as the representative of that profession, to dissipate any such misconceptions if they exist, and to point out what pharmacy has done in the past, is *now* contributing to a better health service, and to outline for you plans for the future.

The fact that the ancient and honorable profession of pharmacy has been exploited in many instances, cannot be denied. For those who are responsible for so prostituting it, we hold no

condonation or excuse. On the other hand, for those pharmacists who are practicing their profession but who for business expediency have been forced to engage in the sale of articles of merchandise other than drugs, medicine, and medical supplies, we are profoundly sympathetic because surveys show that a vast number of them are suffering from nostalgia for more exclusive professional activity—a desire which they cannot afford to gratify. The fact that a large percentage of the gross business done in the average drug store is from the sale of non-professional items, cannot be held by any pharmacist as a valid excuse for giving inferior professional pharmaceutical service to his physician and his clients. In fact, there is no question in my mind whatsoever as to whether a pharmacist, coerced by economic conditions into functioning in the dual capacity of a professional man and a genteel merchant, is precluded from being highly efficient professionally. He is not. The pharmacist who is influenced by his gross income to the extent that he permits his prescription department to become antiquated, as evidenced by an inaccurate prescription balance, old stocks of drugs and chemicals, dirty utensils, dark quarters, etc., should do the only sensible thing from a business standpoint, namely, devote his entire time and all his ability to being a good merchant and cease masquerading under the sign of a splendid profession. On the other hand, the pharmacist who believes his professional activities essential to a well-rounded efficient health service and because of his belief devotes himself to maintaining departments in his establishment exclusively for professional work, will soon find himself and his specialty indispensable to both the physician and the public. It is not difficult for anyone, physician or layman, to identify such an establishment because, upon entering, he is conscious of a professional atmosphere dominating the place, and which seems to have its source in the prescription department. In such a pharmacy the physician will find much that will aid him in the practice of his profession and the layman will become imbued with a feeling of security, confidence, and faith in the medicines dispensed to him there. The statement has just been made that the pharmacist is trained and qualified to be of efficient assistance to the physician in the practice of his profession. The physician can profit by such a relationship only if he is willing to admit (to himself of course) that there are many things in the medical specialties with which he is not familiar. In these days of rapid scientific development, no professional man can practice safely and progressively and be reliant only upon his own fund of information. If this be true, how can the pharmacist be of service to the physician? I will point out a few of the many ways. The trained pharmacist is a specialist in materia medica and is, therefore, capable and qualified to present to the physician for his consideration, any number of remedial agents of established worth. I think it is generally conceded by experts in medical education that the curricula of medical schools do not include adequate training in materia medica. Most physicians acquire a working knowledge of this specialty after they begin their practice. Because of the rapidity with which new things that are used in the prevention and treatment of diseases are evolved, physicians not infrequently become confused and seek reliable information upon new products. The demand for factual data on these new compounds together with the desire on the part of the doctors to protect the medical profession and the public against fraud, undesirable secrecy and objectionable advertising in connection with proprietary medicinal articles, was responsible for the creation of the Council on Pharmacy and Chemistry of the American Medical Association and the issuance annually of New and Non-Official Remedies. In the not-too-far distant past, so-called detail men were frequently the bane of the physician's existence. Today, this group of men, most of them graduates of colleges of pharmacy, are rendering a service by giving physicians and pharmacists reliable information on new proprietary medicinal products. As a rule doctors appreciate being given this information but so often fail to realize that possibly in the corner pharmacy there is a man who is equally well informed about the newest proprietary medicinal products and also has a wealth of information about standard U. S. Pharmacopœial and National Formulary preparations. This man is willing and glad to impart this knowledge to the physician who seeks it. Not infrequently I am asked why I believe physicians should prescribe, whenever possible, U.S.P. and N.F. products in preference

to proprietaries. In my opinion, three of the most important reasons are as follows:

First, by so doing, the cost of medical care will be somewhat reduced. In this connection, whether we are willing to acknowledge it or not, there is always the possibility in our rapidly changing economic and social world, that this may become necessary in order to circumvent a wave of popular opinion on favor of socialized medicine. Furthermore, by making this saving available to the layman, self-medication will be somewhat reduced. I feel quite sure that one of the most pleasant dreams a manufacturer of a so-called "patent medicine" could ever have, would be to have a fairy princess with golden tresses whisper to him that henceforth a physician's minimum fee would be twenty-five dollars; that every prescription would cost not less than five dollars; and that nursing care could be had for not less than five dollars an hour. Having the health of the public at heart, the health science fraternity believes in preventing and treating diseases by a logical, scientifically-based procedure that permits of no guess work. This procedure must be made available to all classes of people at a cost that is commensurate in some degree with their incomes but, at the same time, it must assure an ample return to the practitioners for their heavy educational investment and their special capabilities. Money is not necessarily the root of all evil but the lack of it is frequently the reason why so many persons pursue the wrong course in dealing with their ills.

Second, the U.S.P. and N.F. preparations available to physicians are the products of the best pharmaceutical minds in this country. They have been formulated upon scientific facts and not upon theory. In fact, they have been proven to be of such indisputable value that many of the basic formulæ have been plagiarized, dressed up in a new color and flavor, christened with connotative names, and sold in beautiful cartons at high prices. For the past several years our own Interprofessional Relationships Committee has made available to physicians, dentists, and pharmacists, cards upon which are shown the comparative costs to the patient of U.S.P. and N.F. products on the one hand and similar "patent" or "protected" articles on the other. When U.S.P. and N.F. products are prescribed, it is possible for pharmacists to charge from 15 to 35 per cent less for these prescriptions and at the same time receive a fair return for their professional service. If patented or protected products are prescribed, physicians do not take advantage of the pharmacists' skill; the cost of the prescriptions to the patients is higher, and the pharmacists receive less in net return for their work. Shall we digress for a few moments to inquire whether such a saving to the patient would have any significant effect upon the cost of medical care? Let us assume that approximately 165,000,000 precriptions are dispensed by pharmacists in the United States in one year at an average cost to the patients of about 85 cents. Of the $140,000,000 expended by the public for prescriptions, about 52 per cent is for liquid medicines. If we arbitrarily assume that a physician could prescribe U.S.P. and N.F. preparations in 20 per cent of these cases and that the financial saving to the patients on liquid preparations alone would be approximately 35 per cent—the cost of medical care would be reduced by approximately $5,000,000. Furthermore, 34 per cent of all medicaments prescribed are solids and are dispensed in capsule, tablet, or powder form. If 20 per cent of these prescriptions called for U.S.P. or N.F. products, the estimated saving (22 per cent) to the patients would amount to an additional $3,000,000. Taken together, it would accrue in a saving of about 6 per cent net on all prescriptions—a nice, and in these days nearly unheard-of, return on any investment. This calculation does not include the $50,000,000 worth of prescriptions dispensed by physicians, hospitals, and clinics. In my own opinion, the physicians throughout the country should realize the importance of prescribing U.S.P. and N.F. preparations whenever consistent to do so, if for no other reason than to effect this financial saving to the patient. If they would adopt this policy, it would seem logical to assume that it would also have some inhibitive effect upon the sale of approximately $360,000,000 worth of "patents" sold every year in the United States.

Third, the U.S.P. and N.F. offer a great variety of adjuvants and vehicles for the physicians' use. The advent of the new National Formulary iso-alcoholic elixirs, together with other flavoring syrups and elixirs, offers great possibilities to

the physician to prescribe "different looking and tasting" medicines. Patients do not infrequently pass judgment on a physician's skill by the color, taste, and general appearance of the medicines which are dispensed upon his prescriptions. The contents of the prescriptions may be entirely different in each case. Furthermore, the prescription may be well formulated and designed to assist in remedying a specific pathological condition but the patient remembers only that the medicine that was ordered for him had a red color, that it tasted about the same as previous medicines, and that it was contained in a bottle about the same size as other medicines he had received upon previous prescriptions from this same doctor. Inquiry shows that physicians who are so unjustly criticized by laymen for this reason, are in many cases not aware that the U.S.P. and N.F. offer them the opportunity to avoid this criticism. The pharmacist, who is qualified, is glad to assist him so as to give the medicines he prescribes greater variety as to taste, color, and general appearance. The procedure is not intended to "fool" the public but rather to inspire greater confidence in the physician—a psychological condition that has been recognized as one of the most cogent factors in the treatment of diseases.

If the time would permit, other sound reasons could be given why physicians should prescribe U.S.P. and N.F. preparations whenever it is consistent with good medical practice to do so. I cannot commend too highly the work of our own and other Interprofessional Relationships Committees for their efforts in bringing these matters to the attention of physicians and pharmacists. A larger number of physicians than we would suspect, have responded enthusiastically and I am convinced that by their so doing, a marked improvement in the forms and types of medication dispensed by pharmacists is noticeable.

A sound ethical policy on interprofessional relations can become effective in improving the health service to patients only on one condition, namely, that the practitioners in the respective fields of the health sciences function within their own professional limits except in the case of emergency. No clear thinking individual can condone the dispensing physician any more than he can the prescribing pharmacist. Both are definitely and distinctly outside of their respective fields and are not qualified either by training or experience to function efficiently in an acquired sideline. The fact that physicians dispense about $25,000,000 worth of prescriptions a year whereas the pharmacists sell approximately $160,000,000 worth of home remedies (such as castor oil, milk of magnesia, Stoke's expectorant, et cetera) and participate in the sale of about $360,000,000 worth of "patent" medicines, is no basis upon which to estimate the extent to which physicians and pharmacists engage in these deplorable practices. Regardless of the extent to which they are practiced by members of each group, they should be discouraged in no uncertain terms in any policy that is designed for the purpose of being directional in ethical relationships between physicians and pharmacists. If the services of a good pharmacist are not available, the physician obviously has no other choice than to dispense his own medicines. But this is not very often the case in our own state because there are about eleven hundred pharmacies each one serving a population of approximately twenty-three hundred. The geographical distribution of these pharmacies is also quite satisfactory. In some instances, physicians have been induced to dispense their own medicines because they have been advised that it would result in appreciably increasing their incomes. Now, gentlemen, the physician is or at least has the reputation of being a very poor business man. When gross profits are balanced against inevitable losses of professional prestige and the restrictions imposed upon him by his limited stock of remedial agents, I state without fear of contradiction that at the end of the year he will find himself not only with a net financial loss but also with a loss of professional dignity and efficiency. The altering of any indicated type of medication so as to make it conform to a limited stock of medicines, especially when nearly every kind is available in a pharmacy, is a distinct violation of the Medical Code of Ethics. Pharmacists prescribe (and I am sorry to say entirely too frequently) for the half-sick and inquiring layman. They too cannot be excused on any grounds whatsoever because they are in no way qualified to do so. If they are motivated by the hope of personal gain, I still maintain that aside from it being unethical, it is decidedly

poor business. What will a pharmacist profit if he does succeed in selling a 35-cent bottle of kidney pills—let us say—when if he had been courteously frank about the limitations of his professional qualifications to prescribe, if he had pointed out the futility and danger of procrastination, and if he had recommended that his client consult a physician, ultimately he would have been rewarded with the privilege of contributing to the return-to-health of the patient by filling a physician's prescription. Also, in a very large per cent of these cases, the pharmacist would have been further rewarded by profound gratitude on the part of the patient. If a definite policy relating to dispensing physicians and prescribing pharmacists be incorporated in a professional code of ethics, much good will come of it. In the eighteenth century, an outstanding physician and pharmacist by the name of John Morgan, said:

"The Wisdom of the ages approved by experience, the most certain test of knowledge, has taught us the necessity and utility of appointing different persons for these different employments (medicine and pharmacy), and accordingly we find them prosecuted in every wise and polished country."

So far I have attempted to show that pharmacists are qualified to contribute their share toward a more perfect health service to the sick. In addition, I have discussed some of the bright and some of the dark sides of professional relations as they exist today. It has often been said that a profession is no stronger than its educational requirements, and this, in general, has proven to be true. However, the history of pharmaceutical education in the United States is the history of any other one of the health sciences; medicine, dentistry, or nursing. In each instance, the profession was long practiced upon a much higher plane than its education requirements indicated. With your indulgence, I would like to outline very briefly the progress of pharmaceutical education since 1900, and then tell you what the colleges and schools of pharmacy in the United States, and especially the one at our own University, are doing to prepare students and assist practitioners to give a finer quality of professional service to the physicians and the public.

I shall not go back further than 1900, which year marked the first concerted effort to promote pharmaceutical education. In that year, there were in the United States, forty-four schools of pharmacy all with independent curricula, with courses ranging in length from six months to two years and with the students receiving upon graduation, a certificate or degree chosen by its individual institution. Realizing the desperate need for coördination in admission requirements, teaching and laboratory methods, length of course necessary for graduation with a certain title or degree, on May 8, 1900, delegates from schools, colleges, and departments representing twenty-one institutions, met in Richmond, Va., to form the American Conference of Pharmaceutical Faculties. Of these twenty-one schools, charter members of the Conference, only four were connected with state universities: Wisconsin, Ohio State, Michigan, and Kansas. At this first meeting of the Conference, the College of Pharmacy of the University of Minnesota was not represented for the very excellent reason that no invitation had been tendered that faculty. At the second session in 1901, Minnesota's petition for membership was presented, was reported favorably, and election followed.

I wish I might tell you that with the organization of the American Conference of Pharmaceutical Faculties, pharmaceutical education came into its own. Unfortunately, nothing of this kind happened. It was a long and sometimes a very discouraging experience, but I can say that from that time the trend was always upward.

I won't worry you with details but will mention only the outstanding results. This small group of forward-looking educators were able to coördinate and stabilize education standards, and they could influence the teaching methods of members schools, but they soon realized that there must be some force stronger than an intellectual one to regulate pharmaceutical instruction and practice. They turned to two already well established and influential organizations. They approached the state pharmaceutical associations for aid in awakening a feeling of pride in the profession and in creating a desire to support the efforts of the educational group; and the state boards of pharmacy for the actual fixing of scholastic requirements. With the aid of these two powerful groups, and especially the National Association of Boards of Pharmacy, in

most states they have been able to effect legislation governing pharmaceutical education that, in 1900, even the most optimistic member of the Conference would have considered impossible.

The first educational victory was the requirement that all entrants must be high school graduates. Then the length of the course was regulated: first, three years; then four years; until, since 1932, thanks largely to the activities of the National Association of Boards of Pharmacy, in practically every state in the Union, an applicant for registration as a practicing pharmacist must be a high school graduate, must have at least one year of practical experience, and must be a graduate of a four-year professional course in an accredited school or college of pharmacy. The time is not far distant when the minimum educational requirement will be five years of professional study. Furthermore, it is generally conceded it will be but a few years until the colleges of pharmacy in the United States will be definitely classified and rated not only by the American Association of Colleges of Pharmacy but also by the National Council on Education.

Those who are engaged in professional educational work have always been very anxious and willing to be of service to practitioners in their particular fields. From time to time, graduates from the College of Pharmacy of the University of Minnesota have returned to the Institution seeking either to refresh their memories or to acquire additional information. These cases, however, were rare. It was not until some of the ideas of President L. D. Coffman with respect to continuation study came to fruition this year in the erection of the Center for Continuation Study, that it was made possible for the University to systematically offer "refresher" and continuation courses of study to people in this state. On February 15, 16, and 17, 1937, the University of Minnesota offered this opportunity to licensed practitioners of pharmacy to return to the University and pursue an intensive course of professional study. Because this Continuation Study program is an innovation in education, there was no way of predicting how many registered pharmacists would avail themselves of this opportunity. No precedent had been established from which to determine if there existed a great enough interest in acquiring up-to-date information on professional subjects to take men away from their establishments for four or five days.

The registration in this Pharmaceutical Institute was limited to fifty licensed practitioners. I am proud to state that not only was this quota filled within a comparatively few weeks after the announcement of the course of study, but also that applications for registration were returned. Because of the fine spirit of coöperation between the instructional staffs of the Medical School and the College of Pharmacy, the program of the Institute functioned very successfully. The registered pharmacists in attendance were not only interested in the newer methods for making emulsions, in the changes that had been made from the old Pharmacopœia and the National Formulary to the new, in incompatibilities in prescriptions, and in other strictly professional pharmaceutical subjects, but also were eager to learn from physician members of the Institute's faculty about allergic reactions, the newer developments in endocrinology, bacteriology, et cetera. I wish time permitted me to give you the details of this program and to tell you with what enthusiasm this information was received by the pharmacists in attendance.

So insistent are the demands for similar courses of study that plans are being formulated for giving at least one or two of these Institutes every year. If expressions of appreciation can be taken as criterion for the success of the undertaking, then the faculty of this Institute has every reason to believe that those who were in attendance went back to the practice of their profession better qualified to render a more efficient service to those whom they wish to serve. This is just one way in which the College of Pharmacy of the University of Minnesota is trying to stimulate greater professional interest among the practitioners in the state.

Progress in any experimental science depends upon its accomplishments in research. The amount and character of pharmaceutical research is not generally known and appreciated. It has become so voluminous and so important that the Council on Pharmaceutical Research was established several years ago for the purpose of coordinating, indexing, and publishing the results of such endeavor. The Council has just issued

its second volume, a work very creditable to pharmacy.

At the present time, there are eleven Graduate School students taking the major course work in the College of Pharmacy. Six of them will soon be candidates for the Ph.D. degree. Considering that the entire enrollment in the College of Pharmacy is only about one hundred fifty, this is a satisfactory number of graduate students. In order to acquaint you with their scope, I would like to mention some of the researches now in progress:

1. The development of standards under the Foods and Drug Act for medicinal products, chiefly those of the U. S. P. and N. F. In this connection we are working on the assay of cinchophen and neocinchophen tablets and the use of the volatile solvent method for determination of water in medicated syrups.
2. New methods for manufacturing and stabilizing galenicals, i.e., Syrup of Cherry (Syrupus Cerasi), Syrup of Raspberry (Syrupus Rubi Idæi), Syrup of Thyme (Syrupus Thymi), Syrup of Ferrous Iodide, and Solutions of Calcium Gluconate, et cetera.
3. *Medicinal Plant Investigations:*
   Pharmacognostic:
   (a) The Pharmacognostic and Chemical Study of Chrysanthemum Balsamita, var. tanacetoides;
   (b) The Cultivation of Mints in Acid Peat Soils in Minnesota.
   Phytochemical:
   (a) The isolation of a very active principle from Phytolacca. It depresses and paralyzes the central nervous system.
   (b) Discovery of a narcotic principle in sleepy grass (Stipa Vesayi) found in Southwestern United States.
   (c) Investigation of the claim that Passiflora incarnata is a uterine stimulant.
   (d) A study of the resins of Impatiens biflora (reputed to be of value in treatment of Poison Ivy poisoning).
4. Synthetic Products:
   (a) The synthesis of a new aconitine derivative, in which it is hoped to eliminate undesirable actions of aconite.
   (b) Synthesis of derivatives of Papaverine.
   (c) Alkyl sulfonic moncarboxylic esters as hypnotics.
   (d) Solubility studies on the salts of methionic acid.
5. Physico-chemical Studies: Determination of pH in pharmaceutical preparations of different alcoholic strengths.
6. Pharmacological:
   (a) Researches on a new aconitine block method for cat-assay of Digitalis.
   (b) The effects of methods of preparation and of storage upon the physiological activity of the glucosides of Digitalis.
7. Text Books: In addition to those already published, two new texts are about ready for the press: (a) Dispensing Pharmacy; (b) The Chemistry of Plant Constituents.

From the diversity of these projects, you can readily see that they are of pharmaceutical, pharmacological, medical, and chemical interest.

From year to year, we are concentrating more and more upon our research activities because it is through them we know pharmacy can contribute appreciably to the sum total of medical knowledge.

In conclusion: It is my belief that the results of all of these activities can contribute materially to the establishment of mutually profitable interprofessional relations among the practitioners in all fields of the health sciences. At present there exists nothing more than a tacit understanding in so far as an interprofessional Code of Ethics is concerned. Why should not these ethical conceptions be formulated into a clean-cut, well-expressed policy? Then, for steadfastness in its observance, we could subscribe to and join in the prayer of Maimónides, that eminent philosopher and physician of the Twelfth Century, when he said:

> "The Eternal Providence has appointed me to watch over the life and health of Thy creatures. May the love for my Art actuate me at all times; may neither avarice nor miserliness nor thirst for glory or for a great reputation make me forgetful of my lofty aim of doing good to Thy children."

If we are motivated in our daily practices by such noble sentiments, we should be happy to support a policy in which all of our ideals are so expressed and epitomized that all persons, laymen, and practitioners alike, would understand and appreciate that "Closer interprofessional relationships contribute much to a better health service to the Public."

A COMPARATIVE STATISTICAL TEN-YEAR REVIEW OF THE CESAREAN SECTIONS PERFORMED AT ANCKER HOSPITAL*

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THE operation of cesarean section is not difficult. The difficulty of the operation lies in the answer to the three questions: "Why should the operation be done?"; "When should it be done?"; and, "How should it be done?" These questions can tax the judgment and experience of the most able obstetrician.

The classical section is giving way very definitely and very rapidly to the low section, known also as laparotrachelotomy, popularized by De Lee. The low section has made it possible to save many actually or potentially infected uteri, which is a point much in its favor.

The classical cesarean section is perhaps the easiest to perform as far as mere technic is concerned. The low section is somewhat more difficult but is followed by much less postoperative disturbance. The extra-peritoneal section is rather infrequent and De Lee questions whether the connective tissue of the parametrial region is as resistant to infection as the pelvic peritoneum.

"Once a cesarean section, always a cesarean section" is no longer true. It was true perhaps in the days when the only reason for sectioning a pregnant woman was a contracted pelvis. What is true, however, is the fact that once a cesarean section, then always in a succeeding pregnancy there is the danger of rupture of the old and perhaps poorly healed uterine scar; and the only way to avoid this calamity is to repeat the operation should uterine rupture be threatened or likely to occur.

The literature on cesarean section is truly very voluminous. Confining ourselves just to those articles which have appeared in the last five years, we find that many authors confine their discussions to a statistical analysis of large numbers of these operations performed in different hospitals of the country or over varying periods of time.

Statistics and percentages on all the important points pertaining to the operation of cesarean section vary according to the size of the hospital, also whether the patients are ward or private patients, and whether the operations were performed by members of the obstetrical staff only or by any and all the surgeons who may be permitted to operate in those various hospitals. Our purpose in presenting this subject at this time is to ascertain how favorably or how unfavorably the statistics of a ten-year review of the cesarean sections performed at Ancker Hospital may compare with those of other institutions.

General Review

At the Boston Lying-In Hospital[14] from the year 1894 to 1931 the use of the low section increased from 2 to 60 per cent and, realizing that every pregnant woman in labor is a potential case for sectioning, the vaginal examinations had been reduced from 44 to 20 per cent and the mortality from section had been reduced from 7 per cent to zero during this interval.

Lull[6] made a review of the cesarean sections performed during 1931 in forty-seven different hospitals of the city of Philadelphia. Nine of these hospitals did not have a single cesarean section during the whole year, but one hospital had a percentage incidence of 16.6 while the remaining thirty-seven hospitals had an average percentage of 2.45.

This review from Philadelphia also showed that the maternal mortality rate of the low section was half that of the high or classical; also that most of the operators expressed the opinion that it is not good surgery to do more than the section itself unless it is absolutely necessary.

Stein and Leventhal[15] report on a ten-year period from Michael Reese Hospital (1922-1932). In the first half of this ten-year period cesarean sections reached the incidence of 0.9 per cent but in the second half of this ten-year period, the low section raised the percentage incidence to 3.79, but the incidence of high forceps, craniotomy and version were reduced. This must not be interpreted to mean that the reasons for doing

*President's Address, Ramsey County Medical Society, Saint Paul, January 26, 1937.

TABLE I. FREQUENCY OF CESAREAN SECTION OPERATIONS

Name		Years	Deliveries	Sections	Per Cent
State of Iowa	8	1930-'32	91,738	955	1.
Cleveland Reg. Area	11	1926-'30	45,650	1,047	2.3
Columbia Hospital	14	1920-'30	13,986	228	1.7
Marg. Hague Mat. Hospital	13		9,000	177	2.
Miami Valley Hospital	10	1926-'34	9,527	243	2.55
Michael Reese Hospital	5	1922-'32	15,136	381	2.5
University of Iowa	4	9½ years	5,446	67	1.2
St. Louis Maternity Hospital	3	1927-'35	13,577	218	1.53
University of Maryland	2	1920-'26			2.4
		1927-'33			3.2
University of California Hospital	1	1907-'35	10,923	356	3.26
Frauenklinik, Wien	16	1914-'25			.56
		1925-'35			.6
Ancker Hospital		1927-'36	12,246	38	.31

Highest in the United States outside of Ancker Hospital—*3.25 per cent;* lowest—*1 per cent;* average—*2.15 per cent.*

cesarean sections were increased but rather that the low section is applicable in cases where the classical operation would be contra-indicated and the accoucher forced to do the difficult operation of high forceps, version or craniotomy.

At the Margaret Hague Hospital, two-thirds of the cesarean sections are of the low cervical type.

Plass[10] reporting for the whole state of Iowa for the years 1930, 1931 and 1932, found that the classical section was seven times as frequent as the low section. He and others call our attention to the advisability of an x-ray of the fetus in utero as fetal anomalies may be discovered such as hydrocephalus or anencephalus, which conditions call for different methods of delivery.

Frequency

From the reports of various hospitals which show both the total number of deliveries and the total number of cesarean sections we find the percentage incidence as shown in Table I.

At the Ancker Hospital from 1927 to 1936 inclusive, according to the annual reports of that institution there were 12,246 women delivered and 38 cesarean sections performed, showing an incidence of 0.31 per cent.

The indications for the operation at this hospital were divided into three groups. Group A included the cases of pelvic obstruction, such as contracted pelves of various types and degrees and pelvic tumors, and there were eighteen in this group. Group B included all the bleeding cases that were sectioned, such as various types of placenta previa and cases of premature separation of the placenta, and there were eleven cases in this group. Group C included the remaining cases that were sectioned for reasons such as toxemia, heart and lung disease, and there were seven cases in this group. The charts of two cases could not be located.

Of the thirty-six recorded cases, seven had been sectioned in a previous pregnancy and while this fact may have been an influencing and contributing factor in helping us to decide on a cesarean section, it was not the determining and only factor. All the cases of repeated section had a contracted pelvis or a condition which justified the operation. In none of the repeat cases is there any mention on the chart of any signs or symptoms which suggest a threatened rupture of the uterine scar.

Type of Operations

Of these thirty-six cesarean sections, one was of the extra-peritoneal type; three were of the low or cervical type, while the remaining thirty-two cases were of the high or classical type. Spinal anesthesia was used in three cases.

Hysterectomy and Tubal Resections

Eleven patients were sterilized. In two a hysterectomy was performed: one because of multiple fibroids; and the other, a gravida 8, because of potential infection due to long labor and cephalo-pelvic disproportion. This shows a 5.6 per cent for hysterectomy. The remaining nine cases (25 per cent) were sterilized by

TABLE II.

Name		Hysterectomy	Tubal Resection	Total
University of California Hospital	1	3	31	34
University of Maryland	2		7.7	7.7
St. Louis Maternity	3	27	15	42
University of Iowa	4	10.4		10.4
Massachusetts General Hospital	12		25	25
Royal Maty. Hospital, Edinburgh	15	5.8	28	33.8
Miami Valley Hospital	10		40	40
Ancker Hospital		5.6	25	31.6

means of tubal resection. Other institutions report their percentages of sterilizations as shown in Table II.

Location of the Placenta

It is of interest to note the location of the placenta in our cases of cesarean section. Of the seven cases sectioned for placenta previa, the placenta completely covered the cervix in four, and partially in three cases. In all the other cases, where the placenta was normally in the upper half of the uterus, the operation record shows that in ten of them or 29 per cent, the placenta was on the anterior wall of the uterus under the uterine incision.

Cesarean Section in Cases of Toxemia

Two patients in this series were operated upon for toxemia. One was a gravida 7, thirty-four years of age, whose last labor was induced because of high blood pressure. In her present pregnancy her blood pressure was over 250 mm. Hg systolic and she showed retinal hemorrhages. This was a case of non-convulsive toxemia, perhaps nephritic in type, which was rapidly growing worse.

The other case was one of eclampsia or convulsive toxemia. The patient was a gravida 8, thirty-eight years of age, who had had no prenatal care. She did not improve under conservative treatment but had more convulsions. A thirteen pound living baby was delivered by classical section but the mother died after about forty hours. Without section she no doubt would have died and her baby as well.

In reviewing the literature all the available authors caution against doing a cesarean section for eclampsia, that is, the convulsive type of toxemia, but, nevertheless, they all report cases which were operated upon for this identical reason.

Siegel and Savage,[12] reporting from the medical department of the University of Maryland, state "pre-eclampsia which does not improve under conservative treatment is sectioned, but eclampsia is entirely eliminated as an indication for this operation and these cases are treated by conservative methods."

Skeel and Jordan[13] state that cesarean section is not a popular treatment for eclampsia in Cleveland and its frequency is diminishing.

The maternal mortality for cesarean section in eclampsia is high. Plass[10] reports 10 per cent; Mundell[8] 20 per cent; another author reports 35.7 per cent; Courtiss and Fisher[3] report 37.5 per cent; and Smith[14] reports 50 per cent of maternal deaths following cesarean section for eclampsia.

At the Michael Reese Hospital,[15] cases of partial placenta previa and eclampsia are delivered vaginally as a matter of policy, but occasionally they are sectioned.

Lull[6] states, "Women with eclampsia are not suitable risks for abdominal surgery."

Plass[10] states, "The best obstetric opinion of the day opposes the use of abdominal delivery in the cases of eclampsia."

The Margaret Hague Hospital[16] reports no cesarean sections for eclampsia in a series of 9,000 deliveries.

Maternal Mortality

Plass has estimated that 25,000 cesarean sections are performed annually in this country and that the maternal death rate is between 5 and 10 per cent. Sepsis and peritonitis are the most frequent causes of maternal deaths. The general maternal death rate in the total confinements at the Massachusetts General Hospital[3] is 1.05 per cent.

The average maternal death rate reported by

twenty-nine different hospitals is 6.27 per cent; the lowest reported is 1.3 per cent and the highest is 16 per cent.

TABLE III. MATERNAL MORTALITY

	Per Cent
Plass estimates	5 to 10
Average of 29 hospitals	6.27
Lowest 1.3%; Highest 16%	
Philadelphia, 22 hospitals—1931	10
Large hospitals	6.5
Small hospitals	9.4
Ancker hospital	5.5

During the year 1931, twenty-two hospitals in the city of Philadelphia showed a 10 per cent maternal mortality following cesarean section.[6]

No doubt the most potent factor influencing the maternal death rate is the type of operation performed. At the Massachusetts General Hospital the classical section gave a death rate of 8 per cent while the low section gave a rate of only 1.33 per cent. In the Cleveland Registration area from 1926 to 1930 the classical section gave a maternal death rate of 7.6 per cent while the low section yielded only 2.8 per cent.

The death rate in large hospitals is quoted at 6.5 per cent while that of smaller hospitals is 9.4 per cent. In a survey of twelve hospitals the classical section gave 5.2 per cent maternal mortality while the low section gave 2.5 per cent. The highest maternal death rate is in the hands of the general surgeon.

At the Ancker Hospital in this series of thirty-six cesarean sections there were five deaths in all. One mother died of heart disease four weeks after section; another mother died of pulmonary tuberculosis over three months after being sectioned. These were non-surgical and non-obstetrical deaths. A third mother died of eclampsia about forty hours after operation. This was a non-surgical death and it is very evident that she would have died had she not been operated on, and her baby as well.

This leaves two deaths, or 5.5 per cent, which were definitely due to operation. The first patient had a contracted pelvis. A vaginal examination under proper conditions had been made forty-eight hours before operation and the membranes were reported as rupturing nine hours before operation. She died on the fourth postoperative day of peritonitis due to gas bacillus infection. A low section instead of the classical might have given better results. In the second patient it is not clear from the record what type of cesarean section was done but she had been in labor thirty-six hours and died after four weeks. Perhaps a hysterectomy was indicated in this case.

Fetal Mortality

The average fetal mortality in cesarean section as recorded in the reports of nine hospitals is 8 per cent; the lowest is 2.45 per cent and the highest is 15 per cent.

The fetal mortality in abruptio placentæ has been placed at 100 per cent.

TABLE IV. CLASSICAL SECTIONS *vs* CERVICAL SECTIONS

	Mortality Per Cent		Morbidity Per Cent	
	Classical	Cervical	Classical	Cervical
Lull	6.7	3.8		
Massachusetts General Hospital	8	1.3	93.3	34.8
Cleveland Reg. Area 1926-1930	7.6	2.8		
Survey of 12 hospitals	5.2	2.5		

In the series which we are reporting thirty-six babies must be accounted for. Three of these were pronounced dead in utero before sectioning the mother for abruptio placentæ, again 100 per cent of fetal mortality in this condition. Some operations for abruptio placentæ, however, result in a living baby.

One baby, born by section at seven months due to a progressive non-convulsive toxemia and weighing 2.7 pounds, died in two hours. Another baby, born at seven months due to a central placenta previa and weighing 3.5 pounds, died after one day. A third baby died after one month of bronchopneumonia. The remaining thirty babies either left the hospital with the mother at the time of her discharge or shortly after. This is a corrected fetal mortality of 6.25 per cent.

Maternal Morbidity

The factor of maternal morbidity following the operation of cesarean section is not so easy to evaluate as there are different standards adopted by the different authors and institutions as to what constitutes morbidity.

There are, however, two outstanding factors that contribute most definitely to morbidity; one is the type of operation that is performed, and the other is the management of the patient before operation.

At the Massachusetts General Hospital,[3] of those women subjected to a classical operation 93.3 per cent had fever but of those who had a low or cervical type of operation only 34.8 per cent had fever.

"Every woman in labor should be regarded as a potential cesarean section case until proven otherwise."

At the Margaret Hague Hospital,[16] it was shown that if the membranes had been ruptured less than twelve hours before sectioning the morbidity was 4.2 per cent; whereas if more than twelve hours had elapsed before the patient was sectioned the morbidity was 21.4 per cent. If the patient had been in labor less than twelve hours before being sectioned the morbidity was 4.4 per cent and if longer than twelve hours it was 10.8 per cent. This has been designated their rule of "the twelve-hour safe period." If no or only one vaginal examination had been made before operation the morbidity was 10.6 per cent but if two or more vaginal examinations had been made the morbidity rate ran as high as 30.8 per cent.

In the series of cases which we are reporting we chose to calculate our morbidity on a different basis. Five maternal deaths represent our total or uncorrected mortality. The remaining thirty-one patients spent 475 postoperative days in the hospital, or an average of fifteen and one-third days each (Table V). Any woman who has had a cesarean section under conditions such as might be encountered in any municipal hospital and who needs to spend only fifteen postoperative days in the hospital, certainly did not have much morbidity.

TABLE V. POSTOPERATIVE HOSPITALIZATION

Stay in Hospital	No. Patients
10 days	1
11 days	3
12 days	6
13 days	2
14 days	7
15 days	4
16 days	2
19 days	2
22 days	1
24 days	1
30 days	2

Average stay 15.3 days.

If postoperative hospitalization for a period longer than the average of fifteen days can be regarded as constituting morbidity, then it is of interest to note that all the patients in our series of thirty-six who showed any morbidity, had had the classical section performed. This does not mean that the classical section was not proper and indicated in each individual case, but it does mean that the classical section, even under most favorable conditions, contributes much to maternal mortality and morbidity.

TABLE VI. HOSPITALIZATION LONGER THAN THE AVERAGE PERIOD

Stay in Hospital	(Classical Section)	Temperature
16 days	Partial placenta previa	101 on 2nd day
16 days	Fibroids, pulmonary edema, toxemia	100 highest
19 days	Myomata and hysterectomy	101 on 3rd day
19 days	Placenta previa, vaginal examination and packing	101 first week
22 days	Abruptio placentae	101 on 2nd day
24 days	Contracted pelvis; hysterectomy; wound infection	102 on 4th day
30 days	Partial placenta previa; thrombo-phlebitis	102 on 2nd day
30 days	Third operation; reoperation for intestinal obstruction	103 on 4th day

During this ten-year period, and adding the twin births, there were 12,347 births in the hospital. The national fetal death rate has been placed at 3.2 per cent. At this rate our total fetal deaths would have been 395. We did have 275 stillbirths but we do not know how many neonatal deaths. In many of these stillbirths cesarean section was not entitled to consideration

so we feel that our conservative attitude in the use of cesarean section was not to the detriment of the babies.

Summary

1. The average incidence of cesarean section runs from 1 to about 3.25 per cent.

2. The maternal mortality is between 5 and 10 per cent.

3. The maternal morbidity is tremendously influenced by the type of operation performed and the pre-operative care of the patient.

4. More and more conservatism is being displayed in the use of surgical methods in delivering the toxemic patient.

5. The maternal mortality following section in eclampsia is very high—from 20 to 50 per cent.

6. The classical cesarean section is giving way very definitely and very rapidly to the low or cervical type, also called laparotrachelotomy.

7. The classical section is the easiest to perform but it contributes more to mortality and morbidity. The low or cervical type is not difficult to perform, contributes less to mortality and morbidity and offers an opportunity for obstetrical conservatism. The extraperitoneal type has nothing particularly in its favor.

8. The incidence of cesarean section at the Ancker Hospital and the maternal mortality and morbidity and the fetal mortality compare very favorably with similar statistics from other hospitals.

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EPISCLERITIS AND ITS RELATION TO DISEASE OF THE FEMALE PELVIC ORGANS*

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INFLAMMATION of the sclera and episcleral tissues of the eye, known as "scleritis" and "episcleritis," occurs in a limited variety of forms; it affects one or both eyes of adult persons and is found more commonly in women. The disease may occur simultaneously in both eyes, it may be limited to one eye, or it may affect both eyes alternately at intervals of a few weeks to several years. Periods of active inflammation may last for a few days or several weeks, are prone to recur, and frequently are accompanied by severe pain that is persistent and difficult to relieve.

The final effects of repeated attacks of inflammation are found in clouded corneas, and in eyeballs that are disfigured by staphyloma of the entire ciliary zone of the eye or by discrete areas of bulging anywhere in the anterior half of the sclera through thin, slate-colored regions where deep inflammatory nodules have been situated. The histopathologic appearance of the various forms is that of localized inflammation with increased vascularization and cellular infiltration which does not suppurate nor break down into

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areas of necrosis, but which nevertheless leads to marked thinning of the scleral coat. While scleritis belongs among the rarer affections of the eye, it is not uncommon to find eyes that have been blinded or permanently damaged by it. Adequate descriptions of the disease are to be found in modern textbooks, and most ophthalmologists are familiar with the clinical aspects and courses of the various clinical forms in which it is presented.

The etiology of episcleritis and scleritis is not so well known, though many factors that are thought to be connected with the appearance of the lesions in the eyes have been mentioned, among them tuberculosis, syphilis, leprosy, gout, focal infections and disturbances of menstruation. When several different causes may be ascribed to the appearance of inflammatory lesions that take on a variety of forms, it is probable that a certain form or type of the affection may be caused by one factor, whereas other forms are influenced by another or combination of factors, keeping a somewhat consistent clinical aspect or course in persons of a certain sex or age group.

Histopathologic studies have confirmed the diagnosis of tuberculosis in many eyes enucleated because of grave effects of severe chronic scleritis. Some oculists have stated that nearly all cases of episcleritis and all cases of nodular scleritis are due to tuberculosis, but neither pathologic examination nor clinical experience affords adequate confirmation of this assumption. It has long been known that episcleritis is associated with uterine disorders and is prone to occur in adult females who are subject to disturbed menstruation. A satisfactory explanation of this association, however, has not been offered.

The observation of this association over many years appears not to have been seriously attended, if one may draw such a conclusion from the absence of any mention in textbooks on the therapy of episcleritis of attempts to cure the disease by correcting the uterine disorders. In this instance one may note the influence of continental teaching on the subject of ocular inflammations, so many of which are attributed to tuberculosis. The histopathologic appearance of the lesions of chronic scleritis is undoubtedly indicative of tuberculosis in many cases in which clinical evidence of systemic or localized tuberculosis is lacking; but, other diseases of the eye now believed on clinical grounds to be due to focal infection, or, as in the case of sympathetic ophthalmia, to some unknown cause, also have pathologic characteristics suggestive of tuberculosis and are placed by some pathologists in that category. There is ample evidence, however, in the clinical course of the disease and in the results of treatment of scleritis, to prove that in many cases tuberculosis is not an important factor.

A review of a series of cases of scleritis in women in which no clinical evidence of constitutional disease such as tuberculosis, syphilis or gout was found, directed attention to the relationship between exacerbations of the disease and the menstrual cycle. A specific sex peculiarity could be eliminated from consideration at once, as episcleritis occurs in both sexes, although it occurs much more frequently, approximately 25:1, in women. Our observations at the clinic have confirmed the statements of other writers on the subject that scleritis is not found in children but in adult men and women. The character of the lesions, however, varies somewhat with age and they may be classified into types which are not always clearly defined and which may merge one into the other. It is indeed probable that these types are merely stages in the progressive development of the same disorder, and are influenced by the state of health of the patient, the etiologic factor, or possibly by the nature of the dominant etiologic agent. Discussion will be confined in this paper to the two main types, episcleritis and scleritis.

Episcleritis

Episcleritis was defined by Juler as "an inflamed condition of the episcleral tissue, which may exist with or without sclerotitis. It consists of a dusky-red nodular swelling beneath the ocular conjunctiva. It usually occurs in single patches, measuring from 4 mm. to 6 mm. in diameter, but two or more lumps may appear in the same eye. It is slow in progress, often lasting many months."

The practical importance of distinguishing between a superficial and a deep form of the disease was emphasized by Fuchs, who, however, referred to *episcleritis* as a superficial form of *scleritis* which "makes its appearance as a focal inflammation, a circumscribed inflammatory nod-

ule forming in the sclera." The importance of a clinical distinction between the superficial and deep forms of scleritis is evident from the writings of other authors, Fox, de Schweinitz, Roemer, and Weeks.

The incidence of the disease is mentioned by Fox who stated: "Occurring as a primary affection, episcleritis may in most cases be traced to some constitutional affection, such as gout, rheumatism and syphilis. The condition seldom attacks children, being restricted almost entirely to adults. It is somewhat rare in this country. In the Medical Chi. Hospital service the proportion is about 1:3000, while at Moorefield's Eye Hospital in London the proportion is about 1:700. The frequency with which it attacks women is rather interesting, as most of the patients are nursing mothers or the subject of some uterine affection." I have no other statistics to compare with those of Fox just quoted, but at The Mayo Clinic the proportion would seem to be much less, about 1:2500. Furthermore, I have personal knowledge of only one nursing mother who suffered from episcleritis. Women subject to this affection are free from exacerbations during pregnancy and lactation with but few exceptions.

Roemer stated that, "The distinction (between superficial scleritis, and a deeper form, the true scleritis) is of clinical importance, although no sharp differentiation can be made between them pathologically, because experience has taught us that the prognosis of the superficial form is good, in that no serious injury to the interior of the eye is associated with it, while it is otherwise with the deep scleritis, which involves other portions of the eye." De Schweinitz described the superficial type of scleritis as "dusky-red subconjunctival swellings or nodes, which usually appear in the ciliary region on the temporal side of the cornea, though patches may occur in any portion of the zone. The elevation is sometimes tender to pressure and sometimes not, and there may or may not be much irritation and pain. In some cases of phlyctenular disease of the corneal margin, it is difficult to decide between the affection and episcleritis; what appears to be a patch of the latter may develop into the former." It should be noted that the differentiation of clinical types is not supported by differences in etiology, pathology or chronicity. The principal distinction lies in the complications which occur only with the deeper form.

The disease is often seen in a mild form as attacks of congestion of an episcleral area coincident with the menstrual period; these attacks last for one to three days, gradually fade out without leaving trace, only to recur with the next period. In some women redness of the eye occurs at the time a menstrual period is due even though there is no menstrual flow, whereas in other cases irregular periods may be accompanied by a more or less constant state of epibulbar congestion with periodic exacerbations. A form of evanescent episcleral injection frequently seen in young women of nervous temperament, lasting from two to eight days and reappearing again at intervals of several weeks or months to go through the same course, was called "fugacious periodic episcleritis" by Fuchs, and by Jonathan Hutchinson was described as "hot eye." De Schweinitz listed as causes of episcleritis rheumatism, gout, tuberculosis, menstrual derangements, enterogenous auto-intoxication and focal infections. More important, however, from the standpoint of danger to the eye is the deep form of the disease known as sclerotitis or scleritis. In such cases the complications that follow often lead to blindness through opacification of the cornea (sclerosing keratitis), or cloudiness of the vitreous from choroiditis, and secondary cataract or occlusion and reclusion of the pupil, leading to secondary glaucoma from iritis.

Scleritis

In the deep form of the disease the lesions consist of diffuse bluish-red areas of injection situated in the anterior portion of the eyeball, usually some distance from the cornea. These may be single or multiple nodules and they may coalesce and occupy the entire visible portion of the sclera; they may be very painful to the touch but there is only moderate photophobia and lacrimation. In many cases of diffuse deep scleritis, whitish nodules develop in the inflamed tissue (nodular scleritis). Deep scleritis more often affects both eyes, and as treatment is unable to arrest it, it is prolonged over a course of years. There are remissions lasting months or years, the eyes becoming affected alternately for months at a time; or the eyes may be free from attacks during the greater part of the child-bearing pe-

riod of life, only for the condition to become active again after the menopause. This is more likely to be true of those women who bear several children. The recurrent attack of congestion usually appears at a different place on the sclera, until the cornea has been entirely surrounded by slate-colored spots of thin sclera and the ciliary zone of the scleral coat is practically absorbed.

Just as it is difficult to classify all cases as either episcleritis or scleritis from clinical appearances, so is the pathologic distinction also obscured by the similarity of the tissue in eyes that come to microscopic examination. The typical features of episcleritis are often present in addition to the deep scleritis. In many cases the inflammation is equally marked in the sclera and in the uveal tract. In these the superficial features do not appear to be different from the simple form. The lesions in the uvea may be caused by transmission along the vessels and lymph channels, but Parsons thought them to be evidence of independent foci of inflammation.

In the more severe cases deep scleritis takes various forms. One group has been designated as "annular scleritis," a name given by Parsons to a group described by German authors as "brawny infiltration of the sclerotic." It is a disease of advanced age, usually affecting women more than sixty-eight years of age. Usually both eyes are affected, though not to the same extent. The affected nodules in the sclera do not break down into abscesses. In some cases localized thickening occurs (nodules); in others, extreme thinning of the sclera allows bulging, which results from inability of the tissue to withstand intra-ocular pressure.

With widespread destruction of the anterior sclera and sclerosis of the cornea, glaucoma is a common sequel for which the eye may have to be removed. In many eyes removed for the late effects of chronic scleritis, no areas of caseation necrosis or tubercle bacilli are found, although often small mononuclear leukocytes are present. Foreign-body giant cells may also be present, such as are seen in granulomatous tissue, but nothing characteristic of tuberculosis. All writers, however, who refer to the etiology repeatedly mention tuberculosis, syphilis, gout and rheumatism. De Schweinitz gave the first comprehensive clinical and pathologic consideration of the etiology of the disease in this statement: "Scleritis may be a metastatic inflammation, the original focus of infection being at some distant part of the body, for example, a rectal abscess, a felon, or a purulent sinusitis (Dupuy-Dutemps), and arise because of the more usual focal infections in the teeth, tonsils, and intestinal tract. Disturbances of the internal secretions are doubtless of etiologic influence in many cases."

The relationship between disturbances of menstruation or disorders of the uterus and periodic attacks of episcleritis is mentioned in several textbooks on ophthalmology,[2, 3, 5, 6] but in the recommendations for treatment, none of the authors has suggested that correction of the uterine disorder may influence the course of the eye disease. It is commonly believed that inflammation in the eye is difficult to cure, that the symptoms are difficult to ameliorate by local treatment, that such inflammation is prone to recur even at intervals of years, and that the condition is, in a manner of speaking, self-limited. All concede that it is a chronic disease resulting from infection, either local or systemic. No proof has been advanced that it is due to allergy or to abnormal internal secretions.

Infections in the pelvic organs of both men and women as sources of metastatic inflammation in the eye were studied by the author with von Lackum and Nickel, and our conclusions were reported in 1926. With the establishment of the clinical evidence of the relationship between the cervix uteri and the eye, bacteriologic examinations of the cervix were made in a few cases, and local treatment to the cervix, together with vaccines, was instituted with good results. The etiologic factor was found to be a green-producing streptococcus which was highly virulent, as shown when cultures were injected into rabbits. The streptococcus was found in the cervical canal, in some cases without cervical erosion or other visible evidence of uterine disorder. In other cases an infection of low grade was found in the ducts of the glands in the cervix and even in the walls of the uterus. The severity of the inflammation in the eye was independent of the apparent extent or severity of the disease of the uterus.

Ever since the importance of focal infection has been accepted in the etiology of disease, the value of treating all infected organs has been recognized. Investigation of the bacterial flora

about the teeth, tonsils, and pelvic organs of a patient who is suffering from some disease thought to be due to focal infection has shown that in all these organs in any one patient the same types of virulent organisms may be found. It is quite obvious that to cope effectively with sueh infections the affected organs must be treated. It is useless to remove infected teeth and tonsils and permit other infected areas to remain unmolested. The lack of proper and thorough treatment has done much to discredit the focal infection theory of disease. It may not be possible to deal with focal infection in the pelvic organs as radically as can be done with teeth and tonsils, yet a great deal can be done to diminish the infection and to reduce the severity of metastatic disease. Our studies at the clinic indicate that bacteriologic examinations, particularly of the pelvic organs, were helpful in checking the results of treatment.

Local treatment of the cervix and the use of vaccines did not give satisfactory results in cases of extensive uterine infection, either because the infected regions were not accessible or because they did not yield to such measures as were employed. In some cases the pelvic disease was so severe as to warrant amputation of the cervix or hysterectomy. It was noted that several women who had been subject to chronic episcleritis were entirely free from attacks after removal of the uterus. As other foci of infection had been eradicated, the conclusion that the disease of the eye was caused by the infection in the uterus was justified on clinical grounds. Further investigation confirmed this presumption. Removal of infected uterine tissue is often necessary to eradicate focal infection and is indicated in cases of protracted, severe types of episcleritis when the history of the eye disease and disease of the uterus establishes a definite relationship.

A group of cases carefully studied over a period of ten years at The Mayo Clinic has shown conclusively that the relationship between periodic episcleritis and disturbances of menstruation and disorders of the uterus is in many cases due to focal infection of the pelvic organs, and that a strain of green-producing streptococcus is the bacterial organism which usually causes the infection. The results of surgical measures to eradicate the infection have justified the means employed. Cauterization of eroded areas on the cervix may be sufficient in cases of local cervical involvement. In more extended infections, amputation may suffice. Hysterectomy has been employed only in cases of extensive pelvic disease after less radical measures had proved to be ineffective. A few of the patients of this group were threatened with total blindness from scleritis and sclerosing keratitis and complications that occur through involvement of the uvea. In every case there was immediate relief of the episcleritis following amputation of the cervix or hysterectomy. In a few cases there have occurred mild recurrences of episcleritis which have yielded satisfactorily to local measures and use of autogenous vaccines. There have been no cases of intractable recurrence in which postoperative treatment has been adequate.

Undoubtedly there are cases in which episcleritis is not due to focal infection but to some other cause, such as tuberculosis, gout, syphilis or disease of the nasal accessory sinuses. The relationship between the disease of the eye and disturbances of menstruation in such cases is not established. Obviously, improvement of the eye following pelvic surgery in such cases would be only temporary, if it occurred at all, and could be explained on another basis than that of removal of foci of infection.

Our experience at the clinic has shown that relationship between episcleritis and uterine disorders is often difficult to establish. Until a patient has had it brought to her attention that there may be a relationship, it may not be possible to obtain a satisfactory history. Often there are no symptoms of uterine disorder, and irregular menstruation only confuses the issue. Careful gynecologic examinations combined with bacteriologic investigations must be repeated until the relationship with the eye disease can be established or shown not to exist. If it can be established, the indications for remedial measures are clear.

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PILONIDAL SINUS*

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PILONIDAL sinuses are very frequently encountered in any surgical practice. At the present time there seems to be a marked confusion as to just what types of lesions should be considered in the discussion of this pathological entity, certainly not all the different types of congenital lesions that are found in the sacrococcygeal region, for here, owing to its very complex embryology, is perhaps the most common site in the body for pathological lesions of developmental origin. Only those lesions that are posterior to the coccyx and sacrum should be considered as pilonidal sinuses. It is true that some of these lesions may become very large and then by continuity may extend to the side and even anterior to the above structures. Lesions anterior to the sacrum, however, are of entirely different origin.

The term "pilonidal" comes from the Latin words, "pilus," meaning "hair," and "nidus," meaning "nest," in other words a "hair nest." Various other terms have been used since it was first described by Warren[9] in 1867; "coccygeal, sacrococcygeal or sacral sinus, dimple or fistula"; "postanal dimple, fistula or fissure"; "posterior umbilicus"; "postsacral or sequestration dermoid." The term "pilonidal sinus" is usually used in American literature, somewhat erroneously, however, for true cystic condition is very rare nor are hairs always found.

There are very many theories in regard to its etiology. Warren[10] believed that it was the result of hair growing inward and producing a dimple or hole. Hodges,[4] who gave the name pilonidal sinus to the lesion, advanced the theory that the disease develops due to uncleanliness, abrasions being formed and then hair growing inward. Mummery[7] says that the sinuses are congenital in origin and are remnants of faulty coalescence of the cutaneous covering of the back during early embryonic life. Bevan[1] states that the sinus develops congenitally from a bud of epithelium which has been turned under the integument. Stone,[8] in 1924, stated that the sinus developed from downward growth of epithelial cells and not from the neural canal. Later, in 1931, he brought out a theory that these sinuses are similar in nature to the preen glands found in birds. Weeder[11] says that because we find epithelial cells lining the walls of the tract or cyst cavity, they must be derived from the embryonic ectodermal layer. Masson,[6] quoting Blanch Sutton, says that faulty coalescence of the cutaneous covering of the back is the cause of these cysts. Mallory[5] states that these sinuses develop from remnants of the medullary canal. Gage[2] holds that pilonidal sinus results from the anomalous development of the medullary canal, and that the coccygeal dimple results from disturbance in development of the coccygeal ligament. Fox,[3] in a very recent paper, draws the conclusion that these sinuses are derivatives of the skin ectoderm and not of the neurenteric canal, that they are formed from ectodermal invagination and probably represent a vestigial skin appendage, "preen gland."

The exact etiology of pilonidal sinus is not known, but if one keeps in mind the pathology usually found, the theory of ectodermal invagination is the most plausible explanation.

The disease very seldom becomes evident before the age of seventeen years. Most cases are seen between the ages of twenty and forty years. Rarely have cases been reported in infants. However, I saw one infant seven weeks of age with all the typical predominant pathological findings. It is very rare in the colored races. It is much more common in males than females, in a ratio of about ten to one. The latter may be explained in that males are much more exposed to trauma than females.

The initial symptoms usually follow trauma, often of quite a severe nature. A short time after the injury these patients complain of a swelling in the region of the coccyx and a discharge of foul, pussy material. Localized pain and swelling are very common, but patients very seldom are ill from the lesion. History of re-

*Read before the Northern Minnesota Medical Association, Fergus Falls, Minnesota, August 31-September 1, 1936.

peated swelling with pain and then rupture of the mass, is very often given. Also history of one or more surgical incisions of abscesses is often obtained. In many, one also gets the history of one or more attempts at removing the lesion by radical operation.

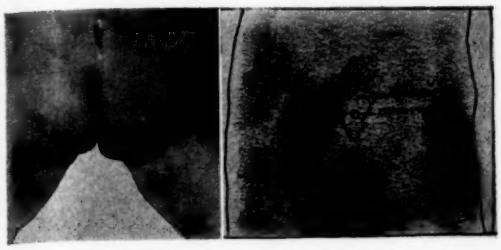

Fig. 1 *(left)*. Photograph that has been touched up, showing the postnatal dimple and two oval openings.

Fig. 2 *(right)*. Schematic drawing showing the opening, the approximate location of the sinus, and the main part of the sinus above the opening.

On examination one may find a swelling from which pus exudes. Occasionally the tumor only is present. In all cases in the midline at the juncture of the sacrum and coccyx, one or more skin lined, round or oval openings are found. This is absolutely pathognomonic and is a requisite in all cases except when radical operation has been performed. There may be lateral, superior or inferior openings which are not skin lined but are covered with granulation tissue. From the latter, hair may also project. Pus usually exudes from these openings. These openings are caused either by surgical intervention or by spontaneous rupture of an abscess. A probe passed into these openings will always go into the sinus cavity and if one uses patience, one can often bring the probe out of the normal opening.

The diagnosis is made by the location over the sacrococcygeal region; by midline oval or round, skin lined orifice or orifices; by the fact that a probe passed into a normal orifice always passes upward and not downward.

Pilonidal sinus should be differentiated from osteomyelitis, tuberculosis and syphilis. This may be done by the history and x-ray examination. Bone can usually be felt in the latter on passing a probe in a syphilitic lesion. Wassermann and Mantoux tests are corroborative. In fistula in ano the probe passes downward instead of upward. A history of repeated attacks and long duration and the finding of the definite round, skin lined opening differentiates the lesion from a boil or carbuncle. Teratomas, fetal adenomas, malignant lesions (primary or secondary) must be excluded by the history, physical examination and microscopic examination. Ordinary sebaceous cysts must be considered, but these are easily excluded.

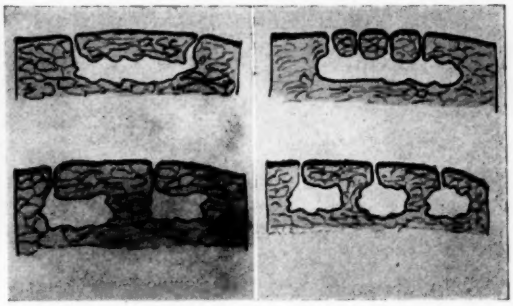

Fig. 3 *(left)*. Schematic drawing showing a sinus with two openings—one above and one below, and two separate sinuses, each with a separate opening.

Fig. 4 *(right)*. Schematic drawing showing a large sinus with four distinct openings. The lower drawing shows three sinuses, each with a separate opening.

The pathology of this lesion must be very carefully studied for on this depends the understanding of the surgical treatment. There are at the midline near the sacrococcygeal juncture one or more skin lined orifices which communicate with a sinus or sinuses below. I have seen the following in my own cases: one external midline oval orifice that communicated with a sinus which extended laterally, slightly downward, but to a greater extent upward associated with a raised granulated opening to the right and slightly above which also communicated with the sinus below; two midline, rounded orifices, communicating with one sinus cavity; three rounded openings with two sinus cavities, two opening into one sinus cavity and one into another; four rounded openings, two leading into one sinus cavity and two into another; three openings, each leading into a separate sinus cavity; five rounded openings, all leading into one large sinus cavity. All of the above had one or more abnormal openings which led down to the sinus cavities. These observations were all made on surgical specimens which had been injected with methylene blue previous to operation. Very often one finds orifices which seem to be blind and cannot be injected, but on careful cross section one can

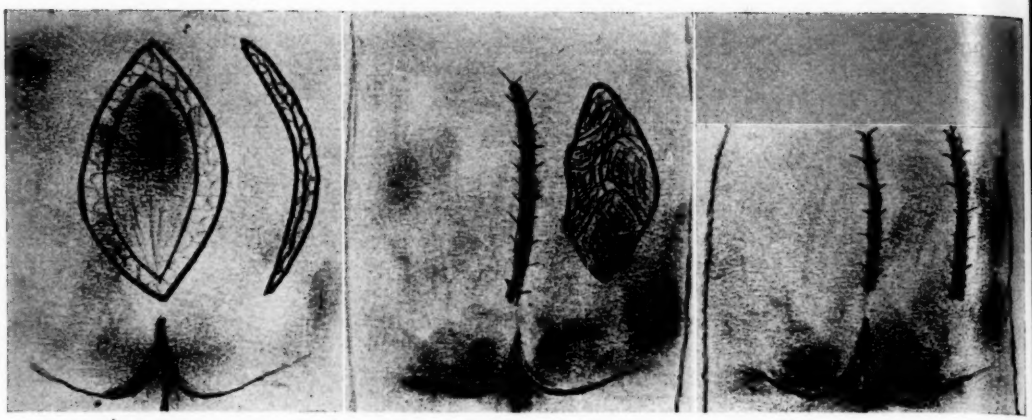

Fig. 5 *(left)*. Schematic drawing showing the modified Lahey technic. The central large opening shows the sinus having been removed and to the outer side is a secondary incision.

Fig. 6 *(center)*. Schematic drawing showing the sinus closed and a gauze packing in the secondary wound.

Fig. 7 *(right)*. Schematic drawing showing both wounds closed.

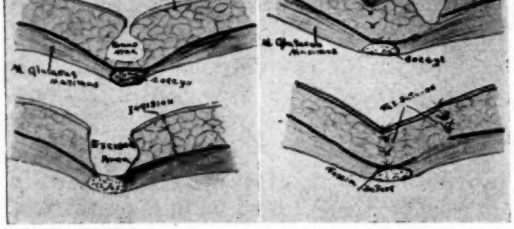

Fig. 8 *(left)*. Schematic drawing showing the sinus area, the opening, fat, fascia, gluteus maximus and coccyx. The lower drawing shows the excised area and the incision at the outer side through the skin, fat, fascia down to the gluteus maximus.

Fig. 9 *(right)*. Schematic drawing, the upper one showing where the fascia underneath the transplanted flap has been carried over the bottom of the sinus to the fascia of the excised wound and all other structures carried over the same way. It shows the gap made by carrying over this fascia. Note especially that the fascia over the gluteus maximus remains separated under the formed wound.

usually find a skin lined tract which leads into a small or large sinus.

The pathology is best illustrated by citing a case as described by our pathologist, Dr. George Berdez. "This specimen is a piece of tissue 11x3x2.5 cm. In the skin one can see near the lower end a smooth opening to one side and somewhat higher is another opening which has a granulating surface from which protrudes some hair. A probe can be passed into both openings and when the specimen is cut both probes are seen in the sinus cavity. The cavity contains some fluid, sebaceous material and some hair. The sac is very irregular in shape and lobulated. Microscopically the sinus consists of granulation tissue and numerous blood vessels; the tissue is infiltrated with polymorphonuclear leukocytes, giant cells, blood pigment, plasma cells, lymphocytes and monocytes. The main sinus nearest to the skin opening is lined with stratified epithelial cells. There is marked extension of inflammatory reaction beyond the wall of the sinus."

The operation of choice in selected cases, I believe, should be a modified Lahey operation. In order to minimize infection no operation should be performed in the acute stage of the disease. Abscesses should be drained and treated with hot packs until the inflammation subsides. This can be done while the patient is ambulatory and not confined to the hospital. The area of operation is prepared for two days before operation. This must be meticulously done to rid the skin as much as possible of all infection. The skin is washed two times daily with soap and water, followed by washing with benzine and then with ether. At the time of operation the skin is again prepared, first washing with benzine and ether and then painting with tincture of iodine, this latter being removed with Richardson's solution.

The bowels are well cleaned by giving large saline enemas followed by instillation of 6 ounces of mineral oil the evening before operation. Enemas are repeated in the morning until the water returns clear. The bowels are kept bound up until the seventh postoperative day.

The anesthesia of choice in these cases has

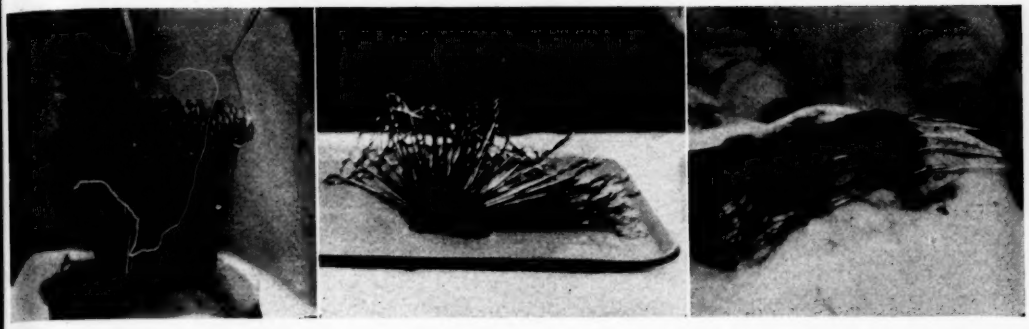

Fig. 10 *(left)*. Photograph showing the technic of applying forceps to the cut edges of skin in order to close up the sinus incision absolutely air-tight.

Fig. 11 *(center)*. Photograph of specimen en bloc, removed with the forceps still intact.

Fig. 12 *(right)*. Photograph showing the wound made by removing the block of tissue.

been 50 mg. of novocaine dissolved in 2 c.c. of spinal fluid, injected well above the diseased area. Personally I feel that local block anesthesia should not be used for it can easily spread the infection. The only objection to the use of spinal anesthesia that has been advanced is that it has to be given near the infected area, but under proper precautions I am sure there is no danger. Caudal anesthesia, of course, is out of the question.

The patient is put in a prone position. All the openings are identified and by using a blunt canula are injected under moderate pressure with ether methylene blue solution. The extent of the cavity is estimated as nearly as is possible, and the lesion included by two curved incisions made through the skin and partly through the fat. Forceps are next placed so that the mesial edges of the incisions are brought together in the midline, thus closing the openings through which infected material may escape. These forceps are placed very close to each other in order to make as near an airtight space as possible. I feel this to be far superior to any attempt at suturing the openings. The incision is then carried down to the coccyx and sacrum on both sides, being very careful not to enter the sinus cavity. All the inflammatory tissue should be included in the block removed, an attempt always being made to keep at some distance from the inflammatory area. If, after removal of the tissue en bloc, one finds a blue stain in the fascia over the coccyx or sacrum, this fascia is removed and even at times the bone curetted. In one case I found that the diseased tissue extended to the side and underneath the coccyx, so the coccyx and some tissue underneath it were removed with the same block of tissue. A second curved incision to the right or left is made at some distance from the original incision, the width of which depends on the cavity formed by the block excision. The incision is carried through the skin, fat and fascia down to the gluteus maximus muscle. The fascia under the flap is then completely freed from the muscle. All bleeding vessels are carefully sutured, for we must have an absolutely dry field. The inner edge of the freed fascia is sewed to the outer edge of the fascia on the opposite side. This is done by using interrupted plain catgut sutures. The skin is closed with interrupted dermal sutures. Dressings are applied and then a very tight covering is made with adhesive over the entire area, the purpose of which is to prevent any further bleeding and to close any space that may be left.

The patient is put to bed in the prone position and kept there for seven days. The bowels are not opened before the stitches are removed on the seventh day. The dressings are never changed unless there are signs of infection, such as rise of temperature or severe pain in the wound.

I am well aware of the fact that there are some surgeons who feel methylene blue is not specific for diseased tissue and I agree with that contention to some extent, but certainly feel that by its use we can frequently remove more of the diseased area. In some cases we found that the methylene blue had not entered all the

sinuses and in some it seemed to have extended beyond the area of diseased tissue as determined by microscopic examination.

In the last five years I have surgically removed thirty-four pilonidal sinuses, twenty-four of

Fig. 13. Photograph of a recent specimen removed, showing seven oval openings and three extraneous openings.

which were treated according to the modified technic described, and ten by the open method with packing. There were no recurrences in the cases treated by the Lahey method and one recurrence in a case treated by the open method.

The series is too small for the drawing of any definite conclusions. These cases have all been traced, but in some the time interval is too short to state absolutely that there will be no recurrence. Primary union was obtained in most of the cases and these required no further treatment after leaving the hospital. Six patients had some drainage before they left the hospital, but after three to five weeks of careful office supervision four of the patients were healed and have remained so. One patient who drained for one year, has been closed for four months. One patient, operated February 29, 1936, is still under treatment. There was some drainage when the patient left the hospital and there still is a small sinus present. Four of the above cases had previous radical operation.

Conclusions

1. The various theories as to the etiology of pilonidal sinus are given with the conclusion that it is of embryological origin and develops from ectoderm invagination.
2. Symptoms with pathognomonic findings are given.
3. The pathology is described with emphasis on the fact that more than one sinus often exists.
4. In selected cases a radical removal of the lesion should be done, followed by a modified Lahey plastic operation.
5. Proper selected cases of pilonidal sinus can be cured with only a short period of hospitalization by the modified Lahey technic.
6. Spinal anesthesia is the anesthetic of choice.
7. Radical operation is contra-indicated in the presence of acute infection.
8. The modified Lahey type of operation is indicated only where the wound will remain clean because the wound must be closed without drainage.
9. When previous radical operation has been performed or where there is contamination, the open operation is the method of choice.

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DUODENO-JEJUNOSTOMY FOR DUODENAL STASIS*

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DUODENAL stasis may result from pressure on the terminal portion of the duodenum; from lowered muscular tone, fatigue, or emotional disturbance with evidences of asthenia, migraine, low glandular activity, and ptosis; from inflammatory adhesions, congenital malformations and new growths; or from the relationship of the duodenum with the liver and pancreas.

Surgically, the chief interest lies in the possibility of compression of the distal end of the transverse portion of the duodenum where we have posteriorly, the inferior vena cava, aorta, diaphragmatic crura and the third and fourth lumbar vertebræ forming a non-yielding mass over which the distal portion of the duodenum lies. Above, the superior pancreatico-duodenal artery presses on the duodenum as a rule and if marked, dilatation above this point will occur. Anteriorly, the root of the mesentery, especially if excessively short, the lower layer of the transverse mesocolon and the superior mesenteric vessels complete the ring through which the duodenum must pass. The upright position of man as contrasted with animals on all fours leads to ptosis. Dislodgement not only of the small bowel but of the right colon and the right kidney may increase compression factors.

Symptoms of compression vary with the degree of the failure of the duodenal contents to pass on normally. The age incidence is usually in the twenties when for most people the stress of life first becomes definite. Abdominal distress comes after eating; nausea may be quite marked. The pain centers above the navel and to the right. Cramps may be of a severe type which is relieved by vomiting. If food is not tolerated, weight loss and dehydration follow with resulting weakness. Psychoneurotic elements become marked. Anxiety, restlessness, and high emotional disturbance follows. Unstable patients are easily upset, whereas more stable types will tolerate a considerable degree of duodenal stasis.

Medical regime includes hospital bed rest, elevation of the foot of the bed, bland diet, sedatives, belladonna. Correction of deficiencies in diet will relieve some cases and temporarily improve others. Except where there is marked dilatation of the duodenum indicating long standing stasis of an obstructed type, thorough medical regime is always indicated. Dr. J. Allen Wilson saw these cases from the medical side. This report deals only with cases that did not respond to medical regime.

X-ray is the final diagnostic procedure showing failure to empty, antiperistalsis, a writhing action, and dilatation of the duodenum. At times the barium will pass in the recumbent position while it is held in the duodenum in the upright position. The clinical symptoms of duodenal stasis often are not sufficient, or at least not generally recognized, making x-ray a necessity in determining diagnosis and procedure. The film study is of value only when definite dilatation of the duodenum is present or when pressure on the duodenum by extrinsic masses or by the root of the mesentery can be demonstrated. In chronic cases the caliber of the duodenum is definitely increased. If there is some obstruction at the root of the mesentery, this enlargement may be considerable. Early evidence of duodenal ileus is not shown by the film study and must be seen by fluoroscopic examination to be recognized. Fluoroscopically there is seen a tendency for barium to remain more or less localized in the dependent portion of the duodenum, and if the condition is a particularly active one, there is seen a marked writhing of the duodenum with active rushes of the barium towards the duodeno-jejunal angle, but instead of passing into the jejunum, the barium is carried back very quickly by an antiperistaltic movement into the bulb and often into the stomach. This process is many times repeated until one movement is finally able to carry the barium into the jejunum.

Surgical procedure is indicated with definite findings not relieved by medical regime. A low mortality rate is found in all the series reported.

*Read at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, May 5, 1936.

RÉSUMÉ OF CASES

Patient	Case 1	Case 2	Case 3	Case 4	Case 5	Predominant Findings
Age, Sex	Female, Twenty-three Years, Single	Male, Twenty-seven Years, Single	Female, Thirty Years Single	Female Twenty-seven Years, Single	Male, Thirty-four Years, Married	Young Female
Previous Operation	Appendectomy, cholecystectomy	Appendectomy	Appendectomy, adhesions	Appendectomy	Bilateral herniotomy	All had previous abdominal operation
History	Severe intermittent attacks of vomiting for 1½ years necessitating absence from work and hospital confinement three times. Epigastric pains. Worried over home affairs.	Abdominal distress after eating centering around navel. Business worries, continued to work. Markedly temperamental. Unable to adjust himself.	Repeated attacks abdominal pain, right sided reference. Severe constipation. Repeated absence from work and hospitalization. Temperamental.	Periodic attacks of abdominal pain. Nausea. Vomiting with larger meals. Occasionally totally incapacitated. Unstable emotionally.	Abdominal pains around navel. Burning and nausea ½ hour after meals. Heavier foods aggravate more. Worked quite steadily. Stable emotionally.	Abdominal distress centering at navel. Nausea and vomiting. Intermittent incapacitating attacks. Emotional or unstable.
X-ray Previous to Operation.	Stasis to and fro peristalsis in second and third portions of the duodenum. Proximal 6-8 inch of jejunum dilated.	Duodenal cap large. Second and third portions of duodenum dilated slightly. Very active writhing and acute peristalsis. Definite puddling.	Definite puddling of barium in duodenum. Slight antiperistalsis. Follow-up at 56 hours shows cecum and ascending Colon with marked stasis.	Hypomotility 6 hour motor meals. Tendency to stasis and antiperistalsis in duodenum.	Dilated duodenal cap. Dilated duodenum throughout. Active antiperistalsis.	Stasis of duodenum. Some dilatation, antiperistalsis.
Operation	September 1933. Duodenojejunostomy.	September 1933. Duodenojejunostomy.	Duodenojejunostomy. Resection of cecum and ascending colon. April 1934.	Duodenojejunostomy. Freed adhesions of duodenum in gallbladder area. September 1933.	Duodenojejunostomy. March 1931.	Duodenojejunostomy. Freeing of adhesions.
Follow-up x-ray	December 1933. Duodenojejunostomy functioning, normal calibre of duodenum, no evidence of ileus.	June 1934. Duodenojejunostomy functioning freely, no stasis in duodenum.	March 1934. Duodenojejunostomy functioning freely, no evidence of duodenal ileus.	June 1933. Duodenojejunostomy opening showing direct and free action normal motility.	August 1932. Anastomosis functioning. No stasis. No "writhing." No dilatation.	All showed good functioning anastomosis with absence of antiperistalsis.
Progress	Slow for three months, then gained 20 pounds. An accident to her mother brought a temporary recurrence for a few days. Stabilized, working, feels best she has for years.	While he returned to work in three weeks, he continued to have crampy distress. Has improved but is still complaining of digestive distress after eating. Still emotional.	Improvement has been constant with exception of temporary upset, intestinal infection in August 1934. Patient feels much improved. Well stabilized.	Has improved slowly but constantly. Occasionally slight cramps with heavy meals. Not emotional.	Improved at once. Has remained so. No complaints.	Improved in all cases. Three markedly, two considerably.

No physiological change is produced as only a foot of bowel is short circuited. The time of operation usually can be selected and surgical preparation made adequate. A left rectus muscle incision permits the reflection of the transverse colon upward and to the right, exposing the approach through the mesocolon. As in the bowel elsewhere, the side opposite the incoming circulation permits the major mobilization. The vessels enter the transverse portion proximally as related to the center of the loop and hence the mobilization is largely made from the distal or lower side. The ease of anastomosis depends on the mobilization of the duodenum. Hemorrhage is most apt to occur near the mesial end of the transverse loop. A duodeno-jejunostomy at the lower portion of the duodenum will usually adequately drain the obstructed area if due to compression factors near the mesenteric root.

Other surgical procedures than duodeno-jejunostomy must be considered. Bands and adhesions causing distortions may be factors in duodenal stasis and their correction is then necessary. The correction of bands and adhesions is usually simple and should be done but if stasis is due to compression in the distal portion of the duodenum at its point of tunneling, it is evident that severing bands or adhesions at the proximal or middle portion will not relieve an anatomical obstruction at the distal portion. Right colon fixation and renal fixation may in some cases relieve the pressure due to displacement or distortion. Colon fixation or colectomy should only be used in unusual cases and should not be done usually at the same time as a duodeno-jejunostomy because of the additional risk. Right colectomy has been suggested for relief of pressure. I have done a right colectomy in one case for stasis rather than pressure. Gastro-enterostomy is not indicated for duodenal stasis because it does not drain the duodenum. It has no place directly in the treatment of duodenal stasis.

This report consists of five personal cases, all local residents who were studied for some time in advance of operation and have been followed since. The experience of my associates has been on the whole quite similar. It shows the following characteristics. More cases occur in females, usually single. The onset of symptoms is usually in the twenties. All had previous abdominal operations with little or no relief. While having some constant gastric discomfort, there were intermittent attacks of varying severity. The pain center tended above and to the right of the navel. Nausea and vomiting were present in the attacks, sometimes to an extreme degree. The patients were anxious about their rather constant distress and when unable to retain food became very emotional, referring all their symptoms to their inability to handle food.

Duodeno-jejunostomy at the lowermost portion of the transverse duodenum was done in all cases. Adhesions were freed. In one case, a right colectomy was also done because stasis in this portion of the colon was unusually marked. The follow-up x-ray showed good anastomosis in all. One patient still complains of some gastric distress though he has gained in weight and is definitely improved. He has been working steadily since three weeks after his operation. There must be other elements neurogenic or organic in his case because the anastomosis shows good emptying. Another man who was the most stable temperamentally of the group previous to operation has had the best apparent result. He is doing regular work and has no complaints. He recovered quickly.

The other three were females, single, in the late twenties, with histories of repeated attacks severe enough to cause hospitalization. They would become very dehydrated from persistent vomiting. After repeated medical efforts, including hospital regimes, they were operated upon during intervals of improvement. Their recovery was slow and slow recovery is usually to be expected. Two had subsequent gastric upsets shortly after operation but they were due to other factors. The mother of one was in a serious street car accident and the other had an acute summer intestinal infection. All three girls had lost heavily in weight previous to operation and their slow recovery was probably based on their poor nutrition as well as exhaustion psychosis. All have gained markedly in weight; all are usefully employed. Operation apparently relieved a mechanical obstruction which they were not able to overcome without the aid of a short circuiting operation.

The C or U shaped duodenum some 39 cm. in length has most complicated relationships, and

among them of great importance is its tunneling passage near its distal ending where there exists potential compression forces of obstruction. Duodenal stasis unrelieved is increasingly being considered as a factor in biliary and pancreatic disease and in the causation of ulcer, besides its production of the clinical pictures above described.

A NEW ANAL RETRACTOR*

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THE problem of maintaining adequate exposure while operating upon hemorrhoids has always been difficult of solution, attempts usually ending in a limited view of the field of operation, or so many hands holding retractors that little room remains for the operator.

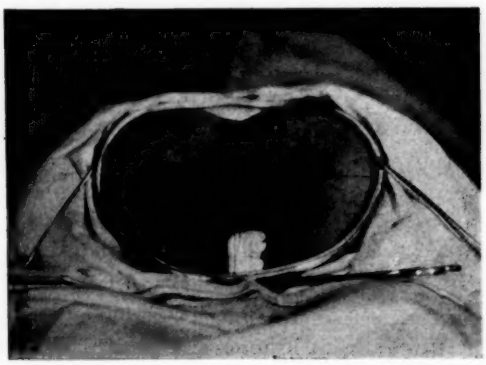

Fig. 1. Retractor in place with patient in prone position.

The ring-retractor shown in the illustration* has satisfactorily overcome these difficulties for me, at the present time having been used in over seventy cases presenting all types of hemorrhoids and many varieties of anal orifice configuration.

It consists of a nine-inch ring of malleable metal with regularly-distributed notches on the periphery. It is to be used only with the patient in the prone position, which, by the way is far more comfortable than the much-used lithotomy posture, permits relaxation of the nates, and is more convenient for both operator and assistant. The ring should be used with some form of local anesthesia, spinal, sacral, or local, since when once placed it is fixed, with no allowance for muscular movement caused by straining as occurs with inhalation anesthesia. It is malleable so that when in place it may be moulded to conform to the curve of the buttocks.

With the anal sphincter completely relaxed with novocaine four points are selected respectively in the mid-line anteriorly to the anus, in the mid-line posteriorly, and at each side. Points should be chosen immediately outside of any skin-tabs which one plans to excise. At each of these points a eleven-inch silkworm gut is inserted, passing beneath the skin for a distance of a fourth of an inch, the long ends hanging free. The

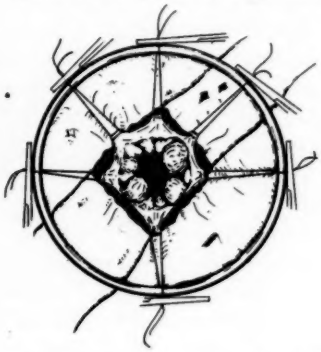

Fig. 2 (*left*). Anus with six silkworm stay sutures.
Fig. 3 (*right*). *A*, Field almost vertical; *B*, field nearly horizontal.

ring is then placed about the anal orifice and one end of each suture is passed under and one end over the ring at the corresponding notch, where the ends are caught with a clamp. Usually four are sufficient for exposure, but occasionally a third pair give additional exposure if placed in the right and left posterior quadrants. The sutures are drawn taut, one at a time until the pull is sufficient and evenly distributed. If relaxation is as it should be the piles are found to be on an almost horizontal surface instead of the sloping sides of the anal canal.

The advantage of the four-suture traction over the four-clamp method is two-fold. The latter requires four extra hands, and in addition oftener than not leaves four small bruised areas where the clamps have been applied. If a kidney-rest or sand-bag is placed under the prone patient immediately distal to the anal orifice, elevating the buttocks, the plane of operation is converted from one nearly vertical to one nearly horizontal. With this appliance correctly applied on a properly relaxed anal orifice, and with the patient prone, the operation of hemorrhoidectomy becomes virtually a one-man operation.

*Retractor made by C. F. Anderson Co., 901 Marquette Ave., Minneapolis, Minn.

EDITORIAL

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BUSINESS MANAGER
J. R. BRUCE

Volume 20 MAY, 1937 Number 5

Benzedrine

BENZEDRINE is a trade name (Smith, Kline and French) for a substance known chemically as "beta phenylisopropylamine." It is known to have several physiologic effects, among which are: elevation of the blood pressure, a stimulating effect on the higher centers of the central nervous system, and the effects of producing relief of gastro-intestinal spasm, shrinkage of the nasal mucosa, an increase in free hydrochloric acid in the stomach and an increase in pepsinogenic activity of the gastric juice. It has been used for some time clinically because of its effect of relieving congestion of the nasal mucosa. Its effect on the blood pressure, which it elevates for periods varying from two to seven hours, is not yet known to be of great aid clinically, although the drug is of benefit in some cases of orthostatic hypotension. The drug has also been used clinically for the relief of gastro-intestinal spasm during roentgenologic examination of the stomach and intestines, and it may have some value in the treatment of disorders characterized by spasm or increased tonus of the gastro-intestinal tract. Experimental studies have shown that benzedrine has power to arouse animals from barbital anesthesia, which observation led to the use of the drug in the treatment of narcolepsy. The results reported are very impressive, and according to these reports the drug does not lose its effect on repeated administration for this condition.

Benzedrine's present vogue is due chiefly to its effect on disorders of moods, such as depression, on chronic fatigue states and associated symptoms such as vague neuromuscular pains, and on sensations of clouded mentality, introversion and introspection. When administered orally in amounts varying from 2.5 to 20 mg. before breakfast and lunch, in many instances it produces marked relief of fatigue, an increase in capacity for work, a feeling of exhilaration, loquaciousness, loss of appetite, dryness of the mouth, tremor of the hands, and sweating and palpitation—which ordinarily occur less than an hour after administration of the drug. Regular administration over considerable periods of time may lead to loss of weight, apparently resulting from reduced appetite. Sleep is ordinarily interfered with if the drug is administered within several hours before sleep is expected.

Remarkable improvement may be noted when the drug is administered to patients with chronic fatigue states not associated with nervousness and psychoneurosis, and to patients with repression states. The results in this group of cases are sometimes startling, as those who are fatigued, slowed mentally, timid, melancholic, and reserved in speech, quite frequently notice marked improvement in or complete disappearance of fatigue, a speeding of the mental processes, happiness, elation, exhilaration and loquaciousness. Vague neuromuscular pains also may be greatly benefited or entirely relieved. Those who are greatly depressed may promptly acquire an interest in their surroundings, desire

activity, laugh, and become jovial. Ordinarily patients who are nervous and psychoneurotic do not notice great benefit following administration of the drug for their nervousness and neurotic symptoms may be increased. They may feel "jittery" and uncomfortably stimulated.

Patients who have indulged in too-large quantities of alcohol may find that the characteristic morning "hangover" is greatly benefited by administration of the drug, and patients recovering from acute alcoholic bouts may note that the desire for more alcohol is diminished.

One fortunate quality of benzedrine is that the effects of its administration can be determined in one day. If there is no beneficial effect noted from its administration before breakfast and lunch, on one day, it appears useless to administer it over longer periods. However, benefit which may be noted following its administration for one or two days may not persist. This is particularly true in depression states, in which it has been observed that the beneficial results following the administration of benzedrine usually gradually disappear. Also, some patients whose chief symptom is chronic fatigue note progressively diminishing effect, but in other cases it seems to continue to improve the subjective status over considerable periods of time.

Benzedrine does not appear to be toxic in the doses which should be utilized clinically, although the results of prolonged administration are not known definitely. Experiences of the medical profession with dinitrophenol should be kept in mind. The contra-indications for clinical administration are not definitely known, but it appears that benzedrine should not be given to patients with any significant elevation of the blood pressure, to patients with significant cardiovascular disease, or, to patients more than sixty years of age. Furthermore, this drug should not be administered to any patient who is not under the close supervision of a physician until more is known about its possible harmful effects.

As quite frequently happens, the drug has rapidly acquired a vogue for all sorts of conditions. People have kept themselves awake and alert for unreasonable long automobile drives and students have utilized the drug for stimulation and acceleration of mental processes during examinations. Under such circumstances more common sense and less benzedrine is ordinarily advisable.

The indiscriminate use of this drug cannot be too severely criticized. It is too easy to substitute its use in exhaustion states for careful search for the causes of the exhaustion and the correction of them. In some instances fatigue, for example, may be a protective symptom and harm may result from banishing it. Until there is greater knowledge relative to the clinical use of this drug and the possible harmful effects which may follow its administration, therefore, it should be used cautiously and only by physicians who are aware that harmful effects may possibly follow. It is to be emphasized that, as far as is now known, benzedrine is nothing more than a stimulant and that it does not correct the cause of various subjective sensations and probably does not fundamentally and permanently alter a psychotic disorder or a state of chronic exhaustion or neurosis.

E. V. ALLEN.

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Refresher Courses in Obstetrics and Pediatrics

JANUARY last "refresher courses" were conducted at the University in obstetrics and pediatrics. The courses were so well patronized, some thirty-three doctors attending, that the same course will be carried to the doctors in six different towns—Fulda, Brainerd, St. Cloud, Fergus Falls, Grand Rapids and Mankato—beginning late in May, 1937. Through the allotment to Minnesota by the Federal Govern-

ment of Social Security funds, the State Board of Health is able in coöperation with the State Medical Association and the Extension Division and the Medical School, to promote this post-graduate type of work in obstetrics and pediatrics.

The same clinicians who conducted the course at the University in January will instruct the classes in the towns mentioned. Other courses will doubtless follow and the personnel of the lecturers will vary, names to be chosen from the faculty of the Medical School and memberships of the Minnesota Society of Obstetrics and Gynecology and the Northwestern Pediatric Society. At the meetings in the various towns, one lecture will be given by a visiting pediatrician and one by an obstetrician, on successive Wednesdays, the lectures to be given at 4 p. m. followed by dinner and an opportunity for informal questioning.

If these refresher courses prove as popular when brought to the profession as they were when it was given at the University, they will be well attended which will warrant their continuance.

Tetanus Toxoid Immunization

IN case of an injury contaminated by soil the possibility of tetanus infection is present and a prophylactic injection of tetanus antitoxin is indicated. Experience in the World War with infected wounds proved the advisability of a second injection ten days after the first because of the temporary nature of the passive immunity produced. A method of producing a more lasting immunity would be a distinct advantage.

There is promise of such a method having been developed. In 1925 the Frenchman, Ramon, first prepared a tetanus toxoid after another Frenchman, Descombey, showed that tetanus toxoid can be detoxified by the addition of formaldehyde as Ramon had shown could be done with diphtheria toxin. Additional investigation showed that a refined tetanus toxoid could be produced by precipitation with alum which not only was much less painful on injection, but produced a greater amount of antitoxin in the injected animal, presumably by its prolonged action.

A number of articles have appeared on the subject of tetanus toxoid since 1925 and although no reports of large clinical series are available the evidence so far has warranted the acceptance of tetanus toxoid by the Council on Pharmacy and Chemistry and its manufacture for clinical use.

While it has never been accurately determined what minimum number of units of antitoxin per cubic centimeter of blood must be present to assure immunity, the toxoid is apparently capable of producing more than the antitoxin, and therefore should be effective. The antitoxin is, however, slowly produced and diminishes in time, but can be quickly increased to high levels by subsequent injections in most cases.

The recommended procedure is the subcutaneous (the intramuscular injection is said to be less painful) injection of 1 c.c. of tetanus toxoid followed in two or three months by a second injection. The antitoxin produced in the blood reaches its height in three to six months following the second injection. In event of a suspicious injury, a third injection of 1 c.c. is given at once and it has been found that in the majority of cases a very high degree of immunity is produced in a week following the third injection.

Objections to the method are: the difficulty in having a patient report at such a long interval for his second injection; the uncertainty as to the patient's understanding the necessity of another toxoid injection in case of a suspicious injury; the poor production of antitoxin in the blood of at least a certain percentage of adults injected. So far there is no practical way of determining clinically the presence of an immunity. While children develop antitoxin well a certain small percentage of older adults show slight response, which conceivably may not be sufficient to assure immunity.

There are, however, distinct advantages to the method. Many individuals have a sensitivity to horse serum either natural or acquired. As tetanus toxoid contains no serum the danger of anaphylaxis is eliminated. Many individuals have occupations which subject them to the likelihood of injuries and repeated injuries which may become infected with tetanus. Yearly toxoid injections would be particularly applicable in such cases.

Final judgment as to whether toxoid inoculations will reduce the incidence of tetanus must

be withheld until it has been used in thousands of cases. Tetanus infection fortunately is comparatively rare, but the use of tetanus antitoxin is extensive. The case that is prevented is never known. The general adoption of the toxoid by an army actively engaged would settle its value.

At present there seems to be good reason for the use of tetanus toxoid in serum sensitive individuals and its use might well be extended to those who handle horses or are in agricultural pursuits. Local reactions from the inoculations are slight and general reactions few. No serious reactions have been reported.

Fracture Ordinances

THE Fracture Committee of the State Medical Association of which Dr. Roscoe Webb of Minneapolis is chairman, and the Regional Committee of the American College of Surgeons of which he is chairman, are endeavoring to have ordinances passed in every city and town in the state in which ambulances are operated to provide for proper splinting of fractures before the victims are transported to hospitals. There should be no opposition to such a program and it seems inexcusable that such ordinances have not been passed in the Twin Cities.

An ordinance to be effective apparently requires some penalty to make it effective. The following ordinance recently passed at Crookston through the efforts of Dr. Arthur Kahala, is herewith reproduced as a model for other municipalities in the state.

Ordinance No. 248

Introduced by Alderman Frank Buckley.

AN ORDINANCE REQUIRING AMBULANCES TO BE EQUIPPED WITH FIRST AID AND SPLINT APPLIANCES TO BE APPROVED BY THE BOARD OF HEALTH AND REQUIRING AN ATTENDANT WITH A CERTIFICATE OF FITNESS.

The City Council of The City of Crookston Do Ordain:

Section 1.—No person, firm or corporation shall operate or cause to be operated any ambulance, public or private, or any other vehicle commonly used for the transportation or conveyance of the sick or injured, without having such vehicle equipped with a set of simple first aid and splint appliances approved by the Board of Health and having in attendance at all times such vehicle is in use a person who has obtained a certificate of fitness as an ambulance attendant from the Board of Health.

Section 2.—Any person desiring a certificate as an ambulance attendant shall make application in writing therefor to the Board of Health. Before the issuance of any such certificate the applicant therefore must present evidence of his qualifications to fill such position and must demonstrate to the satisfaction of the Board of Health his ability to render emergency first aid and to apply approved splints to arm and leg fractures.

Section 3.—Any person violating the provisions of this ordinance shall upon conviction thereof be punished by a fine of not to exceed One Hundred and no/100ths ($100.00) Dollars or by imprisonment for not more than ninety (90) days.

Section 4.—This ordinance shall be in force and effect from and after its passage, approval, publication and record.

Upon the call of ayes and nays upon the passage of the ordinance the vote stood as follows:

Aldermen voting in the affirmative: Widman Emmerich, Eickhof, Spence, Buckley, Linster, Hagen, Hamerlik.

Aldermen voting in the negative: none.

Upon this vote the ordinance was declared passed by the President of the Council.

Passed this 13th day of April, 1937.

J. J. FLYNN, *President of the Council.*

Approved the 16th day of April, 1937.

W. J. KIRKWOOD, *Mayor.*

Attest:

BERGETTA M. LOKEN, *City Clerk.*

CANCER

Aside from the eight diseases which actually registered new minimum death rates in 1936, the only one to show a noteworthy drop last year was cancer. This disease recorded a decline of 2.7 per cent from its 1935 figure. Nineteen thirty-five was the first year, over a long period, to mark a check in the continuous rise in the crude death rate from cancer, and 1936 was the first to register a definite decline.

The increase in the crude mortality rate over a quarter of a century gives a grossly exaggerated picture of the actual rise that has occurred. For example, the crude cancer death rate in 1911, among the Metropolitan Industrial policyholders, was 68.0 per 100,000, while that in 1936 was 93.5, equivalent to a rise of 37.5 per cent; but when allowance is made, by means of rates adjusted for a shift in the age distribution of the policyholders, the increase is reduced to 11.1 per cent.* Even this much lower figure does not take into account several factors which have caused an ever-increasing proportion of deaths to be recorded as due to cancer. The more important among these factors are improved diagnostic procedure and increases in hospitalized and autopsied cases.

The 1936 drop in the crude cancer death rate is, nevertheless, distinctly encouraging; and it is hoped that it marks the beginning of a declining trend which will show that real progress has been made in bringing under control the second disease in numerical importance among all the causes of death, which is still responsible for about 150,000 deaths every year throughout the United States.

Negligible declines from their 1935 mortality rates were recorded for influenza, angina pectoris, and appendicitis.

*At ages 1 to 74 years.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association

B. J. Branton, M. D.
L. H. Rutledge, M. D.
W. F. Braasch, M. D., Chairman
J. C. Michael, M. D.
A. N. Collins, M. D.

As The Doctors See It

A new study of medical care in America has just been completed.

Unlike some of its voluminous predecessors, this study is hailed with enthusiasm in most quarters. It is the report on American Medicine made by the American Foundation Studies in Government and it is *not* a study of statistics or a compilation of answers to a fixed questionnaire.

Instead, the Foundation has assembled an important collection of the views held by 2,200 physicians on many aspects of medical care. Most of the physicians have been in practice twenty years or more.

Everybody who is concerned in any way with the delivery of medical care will find interesting reading in the two volume report (cost $3.50).

"Planning" Is The Answer

Says the *Journal of the American Medical Association,* commenting on it in a current issue:

If any appellation is to be given to this report, it is "thought provoking." The reader must be impressed by the earnestness, sincerity and desire to aid of the great majority who wrote the letters. These actual records of personal experience compare most favorably with previous compilations of inspired statistics collected by economists and social workers who had pre-conceived opinions and pre-digested notions as to what ought to be done with medical practice. This report did not set out to prove that compulsory sickness insurance would solve the medical problem. Neither did it set out to prove that doctors alone could solve all our problems. It was designed to present an adequate picture of the American medical scene with the apparent realization that diagnosis must precede prognosis and treatment. Its most important conclusion is that "planning" and not "a plan" is the answer. Leaders of medical thought and opinion know that intelligent planning will maintain and conserve the real values inherent in good medical practice.

The final section of the summary prepared for release to the newspapers is reprinted here because it provides some provocative observations on the immediate problems that confront every medical society, large or small.

Limited State Medicine And Private Practice

This section assembles the proposals that appear in this correspondence for a further extension of government authority and government funds in the promotion of public health and the provision of medical services, integrated with the private practice of medicine.

The point of view most generally behind these proposals is that increased participation of government by evolutionary process is inevitable and desirable.

Many of the contributors to this chapter look hopefully toward an eventual merging of preventive and curative medicine, and regard insistence on separating them as reactionary and stupid. They believe that preventive medicine will more and more be practiced in the doctor's office and that it will some day be generally recognized that the resources of medical science and the energies of the doctor are properly to be devoted to the prevention as well as to the cure of disease. The better health of the race becomes the objective.

The development of the public health services, federal, state and local, is regarded as an outstanding possibility in the search for solution of present problems.

There is a brief summary of what has been done under the social security appropriations in the way of improving the public health services in various states.

Diseases of Public Interest

It is pointed out that year after year additional diseases are considered to be "endowed with a public interest" involving governmental functioning. The list steadily increases: tuberculosis, cancer, pneumonia, syphilis, have already an admitted "public" status; and there are, in various states, proposals for including diseases of the heart and circulatory system, arthritis and other diseases which have been shown to be a large factor in disability among the population and which require a treatment too long and too expensive to be within the financial compass of most citizens.

The current attempt at venereal disease control

comes in for especial comment, and the need of cooperation between public health authorities and private practitioners is illustrated by reference to the methods required for detecting, diagnosing and treating this disease—and the impossibility of sharply separating the preventive and the curative functions in this case.

One of the most urgent present problems, in general, is felt to be a definition of the truest and most productive relation between private practitioners and public health authorities, whose work, it is submitted, can less and less be sharply dissociated.

A full development of both the preventive and curative aspects of modern scientific medicine makes necessary an integration of public health services with private practice—an intimate, understanding and coöperative development of "state medicine" and private practice—neither of which can apparently reach its ultimate development alone.

There is a discussion of federal responsibility for providing medical care in sparsely populated communities and in areas where uncertainty of crops, drought and other hazards are characteristic and where state funds are also uncertain and obviously insufficient.

There is a summary of the large body of opinion that regards the medical care of the indigent as a logical and direct charge upon tax funds, local to the greatest practicable degree but with state aid, and federal aid under certain conditions and in certain places. In this connection the principle of federal grants-in-aid to the states is mentioned as the best means of working out on a nation-wide base, standards for the care of the indigent, always recognizing the need of variation according to local differences but recognizing also the need of *minimum* standards. Federal participation is suggested as the available means, under the constitution, for enabling states and localities to meet these minimum standards where, without federal stimulus and federal funds, states and localities either would not or could not do so.

Federal Department of Health

A Federal Department of Health is frequently proposed as *justified* under the present powers and degree of functioning of the federal government in matters of health; and as *imperative* with the proposed increases in this functioning indicated by the present appropriations of the Social Security Act, and by such proposals as federal grants in-aid for the care of the indigent sick, mentioned above.

There is a passing reference to the possibility of interpreting (presumably by constitutional amendment) the general welfare clause of the constitution to enable the federal government to establish a national health authority. If this is not done, even under the present constitutional limitations, the federal grants-in-aid principle, as already invoked by the Social Security Act, provides room for the evolutionary development of federal health functioning.

The use of direct tax funds for hospitals is discussed; also the possibility of extending the facilities of tax supported laboratories in order that the scientific aids to diagnosis may be available to practitioners generally, and therefore to patients of all grades of income, at prices they can pay, and free to the indigent.

The relation of government to medical education is not very fully discussed, but in addition to the point already cited under medical education—i.e., that medical schools can hardly control standards or select candidates for medical education according to a highly selective principle if they are dependent upon tuition fees—there is mention of other aspects of a possible relation between government and the medical schools, including a potential relation between university medical schools and public health services.

In the discussion of government aid to research it is recognized that funds of large foundations and philanthropies have hitherto furnished a large part of the support of medical research. There is clear-cut indication that any planning for the organization of medical care on a broad base will need to include provision for competent research, the heart alike of preventive and curative medicine.

New Welfare Legislation In Minnesota

As this issue of MINNESOTA MEDICINE goes to press the long awaited Public Welfare bill has passed both Senate and House and awaits the governor's signature.

It provides for a county welfare board in each county which shall have under its jurisdiction old age assistance, unemployment insurance, provision for the blind, aid for dependent children and relief.

These boards will be made up of five members of whom not less than one nor more than three will be county commissioners. The county commissioners will select ten other names to be submitted to the State Board of Control for selection of the remaining members.

The first duty of all conscientious citizens and especially of the contact committees in each county will be to see that honest and well qualified persons are selected to serve on these boards. This task is particularly important because on this board will devolve the responsibility for selection and hiring of personnel, for formation of policies with regard to relief in each county.

If names of undesirable and unfit persons should be submitted for selection to the State Board of Control medical association representatives should take every opportunity to point them out to the Board. All negotiations with county commissioners and with the county wel-

fare boards must be carried on directly by local representatives of the medical societies.

Here is the golden opportunity to establish all over the state the fundamental principles of good medical care which the Council last year decreed should govern the administration of medical relief as well as other kinds of medical care; that is, free choice of physician for the patient.

The Physician as a Witness

(Monthly Editorial prepared by the Medico-Legal Advisory Committee)

Many cases of alleged malpractice brought in the courts are lost because of three things—inadequate records of the case; inability of the defense lawyer to bring out salient points; and the attitude of the defendant doctor on the witness stand.

Your Medico Legal Advisory Committee feels that no man, a member of our Association, practicing and entitled to practice our profession in Minnesota needs in anyway to be ashamed of his work if he has performed his duty to his patient conscientiously and to the best of his ability.

The "Hang Dog" persecutory attitude assumed by the defendant in many cases makes a bad impression on the court and the jury, gives a smart plaintiff lawyer his clue and leads the medical man being questioned into troubled waters.

A dignified manner spells learning. Many times there is the temptation, even justification, to tell the other fellow where to get off when an unafraid, natural, modest, frank demeanor will show him where to get on.

Do not lose your temper but be courteous to your opponent's lawyer, especially when you are right. Courtesy pays big dividends in lessened arguments, saved time and unwasted energy.

Use one-syllable, understandable, non-scientific words in your testimony if possible. Remember the court, lawyers and jury are not as well versed in technical terms as you are.

Courts prefer medical witnesses who are attentive to questions, who keep their voices up, answer knowingly and quickly without a waste of words.

Courts as well as people don't mind how much you say. It's only the number of superfluous words you use in saying it that is objectionable.

Professional Congress

The outlook is for a meeting of moment, nationally, when the Congress of Allied Professions convenes for its afternoon and evening sessions Monday, May 3, in Saint Paul.

The Congress is to be held in conjunction with the 84th Annual Meeting of the Minnesota State Medical Association scheduled for May 3, 4 and 5 at the Saint Paul Auditorium. Only the large evening sessions will be held at the Auditorium, however. The afternoon meeting will be in the ballroom of the Hotel Lowry.

The social service agencies, the dentists, the nurses, the hospital executives and representatives of the government will all have their chance to talk on one of the most provocative subjects before the American public today: the adequacy and availability of medical care in the United States.

Rorem To Talk

The program, as it has finally taken shape, presents a remarkable and a distinguished representation of the professions and the various points of view.

C. Rufus Rorem, Ph.D., of Chicago, formerly associated with the Julius Rosenwald Fund and economist with the Committee on Costs of Medical Care, at present statistician for the National Conference of Social Work and Director of the Committee on Hospital Service of the American Hospital Association, is one of the foremost non-medical speakers on the program. Dr. Rorem will talk in the afternoon and the evening program on the general subjects, "Are Health Services Adequate and Available in the United States?" and "Suggested Solutions to America's Health Problems," respectively.

Chicago Speaker

Helen Beckley, Chicago, Director of Social Service of the Cook County Hospital, will talk in the afternoon. The other professional representatives are: for the nurses, Daisy Dean Urch, R.N., Winona, President of the State League of Nursing Education; for the dentists, E. H. Bruening, D.D.S., Omaha, Chairman of the Economics Committee of the American Dental

Association; for the pharmacists, Charles H. Rogers, D.Sc., Minneapolis, Dean of the College of Pharmacy, University of Minnesota.

A panel discussion will follow the afternoon talks under the chairmanship of B. E. Youngdahl, director of the Division of Coördinated Field Service, State Board of Control, with the following taking part: Pierce Atwater, Saint Paul, Executive Secretary of the Saint Paul Community Chest; Dr. J. L. McLeod, Grand Rapids, Minnesota State Senator; Olivia Peterson, R.N., Minneapolis, Director of Public Health Nursing, Minnesota Department of Health; E. A. Rieke, D.D.S., Saint Paul, President of the Minnesota State Dental Association; Dr. A. F. Branton, Willmar, President of the Minnesota Hospital Association, and F. W. Moudry, Saint Paul, Minnesota State Pharmaceutical Association.

As noted before in these columns, the evening session will provide a unique opportunity to hear several famous authorities on medical care. In addition to Dr. Rorem, scheduled to speak are Rev. Alphonse M. Schwitalla, S.J., St. Louis, Dean of the St. Louis University Medical School and President of the Catholic Hospital Association; Dr. Martha Eliot, Washington, D. C., Assistant Chief of the Children's Bureau, Department of Labor, and Dr. Maxwell J. Lick, Erie, Pennsylvania, President of the Medical Society of the State of Pennsylvania.

Legislature Adjourns

The 1937 regular session of the Minnesota State Legislature adjourned on April 22. The Committee on Public Policy and Legislation submits below a partial report of some of the bills that were enacted into law and some that were defeated. The Committee made every effort to keep posted on all bills that in any way affected the health of the people of the State of Minnesota and the preservation of high standards for those who would be called upon to treat the public. Numerous hearings were held by the public health committees of both the House and Senate and both committees gave every indication of their desire for the expression of the opinion of the medical profession in reference to these matters.

The Legislature enacted into law a so-called model uniform narcotic act. This law is in many respects similar to the so-called Harrison narcotic act passed by Congress in 1914. The Harrison act is a tax measure and consequently there are certain phases of the narcotic situation that cannot be dealt with by Congress. The law in no way adds to the burden of the medical profession in so far as reports and compliance are concerned. The Minnesota law provides specifically that a compliance with the Harrison act shall be deemed a compliance with the Minnesota law. If a person is convicted or acquitted of violating the federal law he cannot thereafter be tried for a violation of the Minnesota law. The Medical Association believing that such a law is decidedly in the interest of protecting the public health and also is a step in the direction of minimizing crime, gave every assistance to the passage of this bill. The full text of the law will be published in a subsequent issue of MINNESOTA MEDICINE.

The section of the medical act relating to the revocation of license was amended so as to give the Board the power to suspend licenses as well as to revoke them. A further ground for the suspension or revocation of license was added, the amended section being printed in full at the end of this report. The new matter in the law appears in bold face type. Numerous complaints have been made to the medical board involving the unlawful writing of liquor prescriptions, narcotic prescriptions and other acts of misconduct indicating a lack of realization on the part of a small group of physicians of the responsibility and duty that they owe the people of this state as well as their profession. Some of these complaints do not warrant the extreme punishment of a permanent loss of license. It is believed, however, that the suspension of license for a definite period of time will convince these individuals that they too must comply with the laws of this state.

The Legislature refused to pass a bill that would have permitted a masseur to designate himself "doctor of massage." It was the opinion of those opposing the bill that such a designation is misleading insofar as the public is concerned and should not be applied to a group who are permitted to practice in such a limited manner.

The Legislature also defeated a bill that would

have permitted anyone to treat goiters and felons. The bill had for its purpose the removal of these two ailments from the classification of the practice of medicine. We are advised that the bill was introduced because of the efforts of one individual who claimed that he had a cure for goiters and felons. We might add that the bill was unanimously defeated in both the Senate and House.

Additional information concerning bills that were before the Legislature will be published in the June issue of MINNESOTA MEDICINE. The Committee wishes to take this opportunity to express its appreciation of the very courteous and fair manner in which everyone concerned was treated by the Committee on Public Health and Hospitals in the House and the Public Health Committee in the Senate. The Committee also wishes to thank those members of the medical profession throughout the state who gave wholeheartedly of their time to assist us in our work. We believe that much of the success that was achieved was due to the work that had been done in years gone by, by that one individual whose efforts, personality and forceful leadership brought about the increase in membership and the unity of the Minnesota State Medical Association—Dr. Herman M. Johnson. We have missed him greatly but his work is an inspiration to all of us.

Respectfully submitted by
COMMITTEE ON PUBLIC POLICY
AND LEGISLATION

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J. F. DUBOIS, M.D., *Vice Chairman*
L. L. SOGGE, M.D., *Chairman*

MEDICAL PRACTICE ACT

"Section 5707. A person not already authorized to practice medicine in the state, and desiring so to do, shall apply to the secretary of the board for examination, and pay a fee of 20 dollars for the use of the board, which in no case shall be refunded. At a time appointed, or at the next regular examination, he shall prove **that he is of good moral character and** that he has completed four entire sessions of not less than thirty-six weeks **each** at a medical school recognized by the board, and has received the degree of M. D. or M. B. He shall be examined in surgery, medicine, obstetrics, eye, ear, nose and throat, and such other branches as the board shall deem advisable. After such examination, the board, if five members thereof consent, shall grant him a license to practice medicine. The examination shall be both scientific and practical, and shall thoroughly test the fitness of the candidate. The board may refuse to grant a license to, or may **suspend or** revoke the license of, any person guilty of immoral, dishonorable, or unprofessional conduct, but subject to the right of the applicant **or licentiate** to appeal to the district court in the proper county on the questions of law and fact.

The words "immoral, dishonorable or unprofessional conduct" as used in this section shall mean: (a) Procuring, aiding or abetting a criminal abortion; (b) advertising in any manner either in his own name or under the name of another person or concern, actual or pretended, in any newspaper, pamphlet, circular or other written or printed paper or document, professional superiority to or greater skill than that possessed by fellow physicians and surgeons, or the positive cure of any disease, or the curing of venereal diseases, the restoration of "lost manhood," the treatment of private disease, peculiar to men or women, or the advertising or holding himself out to the public in any manner as a specialist in diseases of the sexual organs, or diseases caused by sexual weakness, self abuse, or excessive indulgences, or the advertising of any medicine or any means whatever whereby the monthly periods of women can be regulated or the menses re-established, or being employed by or in the service of any person, concern, actual or pretended, so advertising, or in any manner creating a fear of private diseases; (c) the obtaining of any fee, or offering to accept a fee on the assurance or promise that a manifestly incurable disease can be or will be cured; (d) willfully betraying a professional secret; (e) habitual indulgence in the use of drugs; (f) conviction for willfully violating any narcotic law; (g) conviction of offense involving moral turpitude; (h) conviction of a felony; **(i) conduct unbecoming a person licensed to practice medicine or detrimental to the best interests of the public.**

OF GENERAL INTEREST

Dr. J. O. McKeon of Montgomery, has been re-elected mayor for the sixth consecutive term.

* * *

Dr. Myron O. Henry of Minneapolis was the guest speaker at the meeting of the Park Region Medical Society which was held in Alexandria on April 14.

* * *

Dr. H. J. Aldrich, formerly a lieutenant in a CCC camp at Ray, Minnesota, has become associated with Dr. John F. Briggs, of Saint Paul.

* * *

Friends of the late Dr. O. E. Locken of Crookston, have contributed more than $300 for a civic memorial in his honor.

* * *

Dr. R. V. Sherman, formerly of Thief River Falls, has joined the staff of the Northwestern Clinic at Crookston as specialist in internal medicine.

* * *

Dr. J. Charnley McKinley and Dr. Clarence M. Jackson, both of Minneapolis, have been reappointed to the State Board of Examiners for the Basic Sciences, for six-year terms.

* * *

Dr. and Mrs. Arthur C. Strachauer of Minneapolis, have returned from a two months' cruise down the west coast of South America, through the Straits of Magellan and up the east coast.

* * *

Dr. Charles E. Remy, superintendent of General Hospital, Minneapolis, has recently won a prize of $200 as third place winner in a national essay contest on the value of hospital systems.

* * *

Dr. George L. Joyce, who has practiced medicine at Stewartville for the past eight years, has taken over the practice of his uncle, Dr. George T. Joyce, at Rochester, Minnesota.

* * *

Dr. Edgar Alphonse Hines, Jr., of Rochester, Minn., is among ninety-two physicians of the United States and Canada recently elected to fellowship by the American College of Physicians.

* * *

Dr. and Mrs. Edward Starr Judd will come from Danville, Pa., the first of July to make their home in Rochester, Minnesota. Dr. Judd will have completed a year's interneship there the last of June. He is the son of the late Dr. Edward Starr Judd of Rochester.

* * *

Dr. George M. Higgins of Rochester, a graduate of Knox College, Galesburg, Illinois, in 1914, has been appointed a member of the Alumni Honorary committee for the Knox College centenary, the celebration of which will take place June 11 to 16.

Dr. Francis E. Kibler of Saint Paul, will become a member of the Austin Clinic staff at Austin, about May 1, to succeed Dr. U. S. Anderson. Dr. Anderson left the clinic about March 15 to become associated with Dr. A. C. Strachauer, of Minneapolis.

* * *

Dr. Russell Aanes, son of Dr. and Mrs. A. M. Aanes of Red Wing, has returned to Red Wing after serving his interneship at Minneapolis General Hospital. He will be temporarily associated with the Medical Block Clinic at Red Wing.

* * *

The Sixteenth Annual Convention of the American Physiotherapy Association will be held in Saint Paul, Minnesota, June 27, 28, 29, 30 and July 1, 1937. Convention Headquarters will be at the Hotel Lowry. Miss Marian Denny, 1003 Ivy Street, Saint Paul, Minnesota, is publicity chairman of the Minnesota chapter.

* * *

Dr. Henry C. Cooney of Princeton, was the honored guest at a dinner April 19 on his seventy-fifth birthday. Many physicians from the surrounding territory were present. Dr. Cooney came to Princeton in 1888. He established Northwestern Hospital in Princeton in 1900 and has maintained a large practice in that section of the state.

* * *

The American Board of Ophthalmology will conduct an examination in Philadelphia, June 7, 1937, and in Chicago, October 9, 1937. All applications and case reports, in duplicate, must be filed at least sixty days before the date of examination. Dr. John Green, 3720 Washington Boulevard, St. Louis, Missouri, is secretary of the Board.

* * *

Dr. W. C. Alvarez of Rochester, spoke at the meeting of Alpha Omega Alpha at Vanderbilt University, Nashville, on "The Art of Medicine," early in April. He will speak at a number of other meetings before his return to Rochester, including the Boston University Medical School, Alpha Omega Alpha of Harvard Medical School, and the Ohio State Medical Association at Dayton.

* * *

Dr. Kenneth F. Maxcy, Professor and Head of the Department of Preventive Medicine and Public Health at the University of Minnesota since last fall, has been appointed Professor of Bacteriology in the School of Hygiene and Public Health at Johns Hopkins University, his alma mater, effective July 1, 1937. Dr. Maxcy will succeed Dr. W. W. Ford, who is retiring on account of age limitation.

* * *

The Annual Address in the University of Minnesota Cancer Institute Lectureship will be presented by

Dr. Robert S. Stone of the University of California, on Tuesday evening, May 4 at 8:15 P. M. in the Medical Sciences Amphitheater. The title of Dr. Stone's lecture will be "Theoretical and Practical Considerations of Super-voltage X-rays, Neutrons and Artificial Radioactive Substances for Treatment of Cancer."

* * *

Medical technology, a new professional course for women, will be offered at Macalester College next fall. Dr. Kano Ikeda, pathologist at Miller Hospital, Saint Paul, will be in charge. The academic work will be under the supervision of Dr. O. T. Walters, Professor of biology. A limited number of women with outstanding records in the three-year preparatory course will be eligible to take twelve months' additional work. The students will be candidates for the bachelor of arts degree after their work at the hospital and will be eligible for examination by the American Society of Clinical Pathologists which grants degrees in medical technology.

HOSPITAL NOTES

A drive has been started at Lakefield to raise $13,000 for a hospital.

* * *

Two new additions have been made to the staff of St. Luke's Hospital at Thief River Falls. Dr. Carl L. Eckhardt will have charge of the x-ray department and general medicine. Dr. Hovald K. Helseth will have charge of the obstetrics and pediatrics divisions, as well as general medicine.

* * *

Dr. B. W. Bunker and Dr. F. E. Mork of Elk River, are taking over the old Kline Hospital at Anoka, which has been closed for several years. This hospital has a capacity of fifty beds, including wards and private rooms, and is in good condition.

* * *

Dr. R. W. Campbell of Cass Lake has acquired property including a building formerly used as a hotel, which he expects to modernize and remodel for hospital and office facilities.

* * *

The new $60,000 hospital at Staples was opened for patients early in April. It can accommodate twenty-one patients. Civic organizations are helping to equip the hospital.

* * *

The new wing of St. Barnabas Hospital is now ready for use. It was erected at a cost of approximately $275,000 and increases the bed capacity of this hospital to 175. The hospital is now one of the most scientifically equipped hospitals in America, and is one of the first hospitals to be completely air-conditioned. The original hospital was opened in 1871, the present building being built in 1894.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR MAY

The Minnesota State Medical Association
Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 9:45 o'clock every Saturday morning over Station WCCO, Minneapolis and Saint Paul (210 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month will be as follows:

May 1—Child Health Day.
May 8—Minnesota State Medical Association.
May 15—Some Major Health Problems.
May 22—Nervous Exhaustion.
May 29—Artificial Dentures.

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The annual meeting of the American Association for the Study of Goiter will be held at Detroit, Michigan, June 14, 15, 16, 1937, with headquarters at the Book-Cadillac Hotel. This meeting follows the A.M.A. meeting at Atlantic City.

The meeting will consist of addresses on various phases of thyroid disease and clinics at local hospitals. Dr. Nelson M. Percy, Chicago, is president; Dr. Frank H. Lahey, Boston, president-elect, and Dr. W. Blair Mosser, Kane, Pennsylvania, corresponding secretary of the Association.

INTERNATIONAL CONGRESS OF RADIOLOGY

The fifth annual International Congress of Radiology will meet at the Palmer House, Chicago, September 13-17, 1937. This is the first time the Congress will have met in this country. Delegates and guests from all over the world will attend and the addresses will be given in the speaker's own langauge and automatically flashed on screens in English, German and French. Dr. Arthur C. Christie, Washington, D. C., is president of the Congress, and Dr. B. H. Orndoff, 2561 N. Clark Street, Chicago, is general secretary.

WASHINGTON COUNTY

The Washington County Medical Society held its regular monthly meeting March 9.

Dr. Elmer M. Rusten of Minneapolis was the speaker and his subject was allergy. He gave the newer ideas on this important subject in a very instructive and acceptable manner.

* * *

The Society held its regular monthly meeting April 13. The guest speaker was Dr. G. E. Fahr of Minne-

apolis and his subject was hypertension. He spoke of the research work done by him and others, especially at the University of Minnesota.

Dr. E. K. Geer of St. Paul read the x-ray pictures of positive reactors to the Mantoux test which were taken at the Stillwater High School the latter part of February.

EIGHTY-FOURTH ANNUAL MEETING STATE MEDICAL ASSOCIATION

May 2, 3, 4 and 5

Highlights

Sunday, May 2.—Business sessions of the association will begin with a meeting of the Council, Sunday, 9 a. m., at the Hotel Lowry. At 3 p. m. the House of Delegates will hold its first session in the Hotel Lowry Ballroom to be followed by individual meetings of the seven reference committees that will consider the voluminous committee reports of the association. The Council will meet again at 5 p. m. and at 7:30 p. m. the House of Delegates will reconvene. E. H. Skinner, Kansas City president-elect of the American Radium Society who will be in St. Paul to deliver the annual Russell D. Carman Memorial Lectureship, will talk to the delegates at that time on the subject: How Kansas City Profession is Meeting Social Security Problems. Olin West, Secretary and General Manager of the American Medical Association, will talk on the subject "Better Health Activities" at the same meeting.

Monday, May 3.—An important scientific program is scheduled with separate sections on medicine and surgery, morning and afternoon; scientific demonstrations and exhibits at special hours morning and afternoon. Two important general assemblies with Dr. Skinner giving the Russell D. Carman Lectureship on radiology, and Robert Stone, San Francisco, giving the Citizen's Aid Lectureship on cancer. A symposium on peptic ulcer for both sections at 4 p. m. followed by a panel on the subject.

During the afternoon and evening, the Congress of Allied Professions, held under the auspices of the state medical association but with representatives of all of the professions allied in the practice of medicine and care of the sick actively participating. The Congress proper will begin at 2 p. m. in the Hotel Lowry Ballroom. It will be preceded by individual group luncheons arranged by the participating groups and it will be followed in the evening by an important general assembly on the subject: "Suggested Solutions to America's Health Problems" at the Auditorium Theater. (See Medical Economics section in this issue for further information on this Congress.)

Tuesday, May 4.—There will be separate sections on medicine and surgery again, interrupted by demonstration and exhibit hours; also by two visiting scientific speakers appearing before a general assembly, John M. Wheeler, New York City, professor of Ophthalmology at Columbia University, and Francis D. Murphy, Milwaukee, Professor of Medicine and Director of the Department of Medicine, Marquette University.

A general assembly on Medical Economics with Maxwell J. Lick, Erie, Pa., President of the Medical Society of the State of Pennsylvania; Nathan B. Van Etten, New York City, Speaker of the House of Delegates of the American Medical Association, as speakers.

An Industrial Dinner at which President A. W. Adson will preside and the Honorable Voyta Wrabetz, Madison, Chairman of the Wisconsin Industrial Commission, will be the principal speaker, will conclude the doctors' sessions of the day. The evening will be devoted to a Public Health meeting to be held in the Saint Paul Auditorium Theater at which the Rev. Alphonse M. Schwitalla, S.J., Saint Louis; Dr. Van Etten, Raymond A. Vonderlehr, Assistant Surgeon General of the United States Public Health Service, and Walter C. Alvarez, Rochester, will talk. This meeting will be held under the sponsorship of the Ramsey County Medical Society and the Ramsey County Public Health Association. Mr. Carl W. Cummins, Saint Paul, will preside.

Wednesday, May 5.—The entire day, with the exception of a general assembly for installation of new officers, will be devoted to the Northwest Industrial Medical Conference at which President Adson will preside. Several distinguished visitors will speak, including Michael L. Mason, Chicago, and Dr. Lick, as well as leaders in industrial medicine in Minnesota. This is the first conference of its sort ever held in connection with a state medical meeting. It will conclude with a panel on the subject directed by the chairman, which will also conclude the meeting.

For further details on these sessions see the printed programs sent to every member through the mails.

Not only physicians, but dentists, social workers, nurses, industrial surgeons from all over the Northwest including the Great Northern Surgeons who have chosen to join with the medical association for the Wednesday program, will attend this meeting. *Make your hotel reservations immediately.*

Auxiliary Sessions

An interesting and attractive program of business sessions and social events has been arranged for members of the Women's Auxiliary and all visiting women. The Auxiliary program will begin with a State Board meeting and luncheon at the Saint Paul Athletic Club, Monday, to be followed by a tea in the afternoon at the home of Mrs. H. B. Zimmerman, 1530 Edgcumbe Road.

The annual meeting of the organization will be held Tuesday morning at the Saint Paul Hotel followed by a luncheon. A special dinner for Auxiliary members and visiting women will be held at the Saint Paul Hotel at 6 p. m.

PROCEEDINGS of the MINNESOTA ACADEMY of MEDICINE

Meeting of March 10, 1937

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, March 10, 1937. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the president, Dr. E. M. Jones.

There were forty-seven members present.

Minutes of the February meeting were read and approved.

The president called attention to the new screen which Dr. Thomas S. Roberts had presented to the Academy. On behalf of the members, Dr. Jones said he wished to accept this gift and express the very deep appreciation of the members to Dr. Roberts.

The scientific program followed.

PNEUMONIC PATHOLOGY IN THE UPPER LUNG FIELDS

Inaugural Thesis

LEWIS M. DANIEL, M.D.

Minneapolis

The purpose of this paper is to present the problem which confronts us in the differentiation of tuberculous and non-tuberculous pulmonary pathology where we have clinically the picture of prolonged or unresolved broncho-pneumonia, and where the evidence from the laboratory and the x-ray is inconclusive. I would like to summarize briefly what has been found to be pertinent in the meagre literature on this subject and to review four cases in point which have been under observation during the last year.

In the French literature considerable attention has been given to the transitory shadows of pulmonary consolidation which, although they are short-lived, present about the same initial problem in diagnosis. Jeanneret and Fame, in *Revue de la Tuberculose*, December, 1933,[5] discussing the subject of fugacious x-ray shadows, cite several cases in which the differential diagnosis between tuberculosis and influenzal broncho-pneumonia could be made only by studying the manner of resolution as shown in serial x-rays. At the outset this type of shadow, which they describe as an "Ombre radiologique fugace," resembles tuberculous pneumonia. The absence or mildness of symptoms and the disappearance often in as short a period as one week decides the question, but many people, according to the writers, have been and are being institutionalized for months on the evidence of a single x-ray.

Cain, Oury, and Barnaud, in the *Bulletin et Memoires de la Societe medicale des Hopitaux de Paris* (1932),[3] cited cases in which the mode of onset and early symptoms made them hesitate between the diagnosis of tuberculous pneumonia and a mild broncho-pneumonia. X-ray evidence distinctly favored tuberculosis but a plate taken a month later showed resolution to have taken place to such an extent that their diagnosis was abandoned.

Bernard and Lamy,[2] writing in the same publication in 1933, presented two more such cases in an article entitled "Pneumonies prolongees simulant la tuberculose." In the first case the findings one and one-half months after the onset were still characteristic of tuberculosis but, because of former experience, they refused to make a positive diagnosis. At the end of three months the chest was clear. The second case was almost identical. Both cases were in the upper lung fields.

The French writers on the subject feel that the sudden onset of the acute episode is the most important circumstance which might lead to the diagnosis of a non-tuberculous lesion.

A pertinent article on this subject was written by Dr. R. G. Allison[1] in 1926. He mentions the struggle of the clinicians and the roentgenologists to arrive as early as possible at a positive diagnosis in chest pathology, an enthusiasm which resulted in many mistakes. He believes that there are many cases in which pneumonic processes occur in the upper lung field in which serial x-rays may reverse the diagnosis favored in the first x-ray and, furthermore, to quote "A critical review of these cases, after the end-result has been determined, has given no additional information as to how we may differentiate the tuberculous from the non-tuberculous, at the time of the first examination."

Case 1.—A woman of seventy, whose previous examinations had shown evidence of healed tuberculosis, caught a cold. A week later a cough developed and then chills and fever mounting to 103°. She had physical signs characteristic of broncho-pneumonia and was hospitalized. X-ray taken shortly after her admission to the hospital showed consolidation of part of the upper right lobe and it was interpreted as tuberculous. Her leukocyte count never went above 8,000 while she was in the hospital. Sputum examinations were negative. She continued to have a fever of 99.6° to 100° for a month. A second x-ray was taken at that time. The upper right lung showed only the evidence of the old fibrous lesion which had been there before, but a new area of consolidation extending out from the root of the right lung was described. From the x-ray it was impossible to say whether this represented broncho-pneumonia or an extension of tuberculosis. During the next three weeks she was afebrile and improved rapidly in strength so that she was up and around. A final x-ray, taken two months after the first one which had so strongly suggested tuberculosis, showed nothing to support this diagnosis.

Case 2.—The second case is that of a man of fifty, first examined about a year ago because of a digestive upset. At that time it was noted that there was tuberculosis in one member of his family and that he had evidence of an old healed process. He remained well until May, 1936, when he contracted an acute respiratory infection. He had chills and fever mounting to 103° at the outset, and considerable prostration. The physical signs in the chest were absent except for a

small area of bronchial breathing in the right axilla. The clinical diagnosis was broncho-pneumonia and it was believed to be limited to a very small area. One month later he was entirely free from symptoms. He had had no cough and no fever for about two weeks. From the fluoroscope it appeared that his pneumonia had not resolved. An x-ray taken at the time was suggestive of tuberculosis and the man was sent home to be quiet for a month to see what changes would develop. This observation and rest treatment continued for five months. The patient gained twenty-five pounds and felt better generally than he did before his illness. He has never had any cough or temperature since the acute stage of his illness. There has been no change in his x-ray picture during this period of five months. It seemed as though we might disregard the x-ray picture; but finally, after repeated attempts to get a satisfactory sputum specimen, we were successful, and found tubercle bacilli.

Case 3.—The third case which I wish to summarize is that of a girl of twenty-two, who, after an acute upper respiratory infection which continued for two weeks, was x-rayed and advised that she had tuberculosis and must go to a sanatorium. At that time she had a mild unproductive cough, a temperature which rose to about 100° in the afternoon, and she complained of feeling very tired. She had physical signs of bronchial breathing in small areas in both the right and left upper lung fields. Laboratory findings were negative except for a leukocytosis of 17,000 with 74 per cent polymorphonuclears. (The x-ray plate taken at that time was shown.) Report on this is as follows: "Pneumonic consolidation left upper lobe and base of the right upper lobe. While this lesion has the characteristic appearance of pneumonic tuberculosis, I believe that further plates should be made in a few weeks to determine definitely, etc." After one month of rest at home she was x-rayed. She had gained fifteen pounds and had no cough or fever. The x-ray showed nearly complete resolution of the infiltration of the right lung, but still considerable remaining in the left upper lobe. It was felt that some of the lesion was acute pneumonia which was resolving and it was still impossible to say whether the remaining consolidation was unresolved pneumonia or tuberculosis. In October she felt so well she was allowed to go back to work. Pictures taken at that time still showed some infiltration on the left side, but the right side was practically clear. The roentgenologist felt that the long delay in this resolution would indicate that the lesion was tuberculous. Clinically, this girl is well; no fever, no cough, no fatigue, sedimentation rate normal, hemoglobin 85 per cent, weight 20 pounds more than last winter.

Case 4.—One more case before I attempt to comment. This is a man of thirty-six who was seen last February with what appeared to be post-influenzal bronchitis. He recovered completely in two weeks, or would have perhaps if an x-ray film had not been made of this chest. Diagnosis: moderately advanced fibrotic tuberculosis of productive type with evidence of recent activity. His life and activities were, of course, modified after this but, from that time to the present, there has not been a single symptom or complaint which might be related to tuberculosis. Periodic x-rays have shown no change except that one taken in October was reported as showing a tendency to quiescence and in another examination made in another city in November it was thought that the fibrosis was of no significance at the present time.

In a chart which is represented here, an attempt is made to summarize the findings in these four cases.

SUMMARY OF FINDINGS IN FOUR CASES

F-70	M-50	F-20	M-36
All had positive tuberculin tests			
All had accelerated sedimentation rates at the outset			
All had negative sputa at the outset			
All had acute onset			
Three had chills and fever with temp. of 102°, which gradually subsided over a period of about 1 month.			Fever for one week.
Three had moderately severe cough and complained of chest pain.			Slight cough. No pain.
Mucopurulent sputum.	Little or no sputum in any of these instances.		
Three showed physical signs of broncho-pneumonia of limited extent.			Increased bronchial sounds with moist râles.
Coarse râles.	No râles.	No râles.	
W.b.c. 7,200 P.m.n. 83%	W.b.c. 12,000 P.m.n. 61%	W.b.c. 17,000 P.m.n. 4%	W.b.c. 17,000 P.m.n. 80%
INITIAL X-RAY EVIDENCE			
Tbc. Pneumonia (?)—in first three cases.....			Fibrotic productive with acute infection superimposed.
FINAL X-RAY EVIDENCE			
Resolved broncho-pneumonia. No recent tbc.	Fibroid consolidation tbc.	? Shadow still disappearing.	Old fibrosis—quiescent.
No symptoms.	Positive sputum.	No symptoms or signs. Sedimentation normal	Same status as before.
Activity resumed.	Treatment.	Gain 20 lbs. Working.	No trouble.

This recitation of four related cases of pulmonary pathology is of no importance in the advance of our knowledge in that field except for the fact that it presents the problem of the internist who is not specializing in chest diagnosis, confronted with contradictory findings, anxious patients and considerable responsibility.

It is safe to say that the acceptance of first x-ray impressions in these cases would have been unfortunate. The roentgenologist suggested subsequent study in his first report.

It must be emphasized that the character of the initial illness did not furnish any satisfactory indication of the ultimate outcome.

My third point is that in these four cases, all observed carefully in the last year, clinical observation and laboratory findings gave better guidance for the ultimate conduct of these cases than did the x-ray findings. However, the x-rays of course were of great value in correlating the clinical conclusions.

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THIRTY-TWO YEARS OF PATHOLOGY AND SURGERY IN ONE INDIVIDUAL

A. R. Colvin, M.D.

Saint Paul

This case is shown and reported to call attention to the recuperative power of the human and the possibilities of surgery extending over a period of thirty-two years. Briefly enumerated is a list of conditions and operations.

1. Mastoid suppuration.
2. Opening abscess of jugular vein.
3. Arthrotomy of knee for suppuration.
4. Arthrotomy of shoulder for suppuration.
5. Opening abscess on chest wall.
6. Amputation through thigh for intractable suppuration of knee joint. (Dr. Gilfillan.)
7. Repair amputation stump.
8. Cystoscopies.
9. Ureteral calculi removed.
10. Hemorrhoidectomy.
11. Prostatic abscess following urethritis.
12. Osteotomy of femur from deformity following dislocation of hip.
13. Tonsillectomy. (Dr. Warren.)
14. Herniotomy. (Dr. Hauser.)
15. Fracture of femur.
16. Cholecystectomy for cholecystitis with calculi. (Dr. Hauser.)
17. Bursting open of incision for above.
18. Ruptured wound repaired.
19. Repair of abdominal hernia.
20. Thoracoplasty for pulmonary tuberculosis. (Dr. L. Daugherty.)
21. Removal of diverticulum of esophagus. (Dr. Greth Gardiner.)
22. Open cervical abscess.
23. Tracheotomy for tuberculosis of larynx. (Dr. Gardiner.)

Since two years after the beginning of his surgical life, this patient has worked steadily except for an occasional holiday to have another operation performed. There are some features of his excursions into surgery which seem worth while relating.

The patient is a man, aged fifty. He was admitted to Ancker Hospital on February 7, 1905, in a delirious state. He had a suppurating shoulder and knee joint and an abscess of his chest wall. These evidently were localized lesions due to pyemia. Further investigation revealed suppurating otitis media, with tenderness over the mastoid process and along the course of the internal jugular vein. On February 9, 1905, the jugular vein was exposed and opened and found to contain pus, the pus being limited below by proliferating endophlebitis. The mastoid suppuration was dealt with and the sigmoid sinus contained pus which was limited by proliferating endophlebitis above, but was continuous with the pus in the vein below. The suppurating knee and shoulder joints and the abscess in the chest wall were then opened and drained.

While reviewing once more phlebitis, thrombosis, embolism and related conditions, one was impressed again with the importance of keeping in mind the variquences, and the manifold reactions of tissues to inable nature of infections in their course and consefections. It was interesting, for instance, to note the swing from Hunter's position that phlebitis is primary to the position of Virchow that thrombosis is the cause of the phlebitis, and the swing back again to the opinion now held that in the great majority of cases the thrombosis is secondary to the phlebitis and that many of the so-called bland thromboses are really due to mild or non-suppurating phlebitis such as occurs in influenza, pneumonia, postoperative, etc.

Phlebitis with consequent thrombosis can in this sense be likened to the various grades of arthritis and, indeed, I shall always remember the patient who came to me after an operation for simple hernia, who, following a postoperative phlebitis, suffered from multiple non-suppurating granulating arthritis from which he was permanently crippled. I opened one of the joints and so demonstrated the granulating character of the arthritis. In another case, following a suppurating tendon sheath infection, there developed multiple abscesses in the calf muscles, with a non-suppurating shoulder and hip joint infection without demonstrable effusion. This patient recovered, with some stiffness of both joints.

I recall a mastoid case in which a diagnosis of lateral sinus phlebitis was made; the upper end of both femurs were involved in suppurative osteomyelitis; the sinus was not opened, and the boy recovered. The sinus thrombosis quite evidently was not of the suppurating kind; the osteomyelitis was.

While reflecting on these and other cases, I was impressed with the infrequency with which the lungs —through which the microörganisms have to travel to reach the general circulation—are the subject of inflammatory reaction. McEwen, however, in his great work on pyogenic disease of the brain and spinal cord, divides his cases of sinus infection symptomatically into: (1) pulmonary; (2) enteric or abdominal; and (3) meningeal. I had one patient, a woman, who, after sinus infection due to mastoid disease and operation thereon, developed pneumonia and empyema in the midst of pregnancy and was delivered of a normal child before leaving the hospital. Perhaps sinus phlebitis is recovered from more often than we know. Certainly the non-suppurating kind does.

It is instructive that in this man's case, which we are presenting tonight, the thrombosis was limited by endophlebitis both in the jugular vein and lateral sinus, thus effectually walling off an abscess in a section of the vein.

The diagnosis of his ureteral stones at a time when urethritis complicated the picture and x-ray was poorly developed, was somewhat difficult; he consequently suffered a good deal from pain in the back and left lower abdomen, and thus had a working knowledge of kidney pain. Later he began to complain of "kidney pain" on the opposite or right loin, which, he said, was similar to that he had had before on the left side, and insisted that the right kidney be operated upon. This

was, of course, refused and it was not until some time later that I discovered that his hip on the left side was ankylosed in a faulty position of flexion of about 35 degrees. An x-ray disclosed a hip dislocated on the dorsum of the ilium. This dislocation was due to the position in which he lay for so long with a suppurating knee. After observing his manner of walking it was seen that with the artificial limb worn with the stump, in a fixed flexed position, each step was practically a contortion of his lumbar spine. It was concluded that his pain was due to a traumatic arthritis or sprain of the spine, and osteotomy through the base of the neck resulted in a corrected position of his stump with complete relief of his lumbar pain; and there has been no recurrence.

Except for the various surgical experiences enumerated, he has remained well and is now again very insistent on going back to work, saying that he feels better than he ever did in his life.

The patient was presented.

Discussion

Dr. William Davis (Saint Paul): I am not going to discuss Dr. Colvin's case from the surgical standpoint, but wish to make one or two philosophical observations that came to me as I listened to the report.

In his lectures on anatomy to our class, Dr. Oliver Wendell Holmes presented a tattooed man who was covered from head to foot with tattooing—figures and animals and devices of all kinds. Dr. Holmes, in commenting on him, very gravely said "This man is an example of the tortures that man can inflict and that man can endure." To paraphrase Dr. Holmes, this patient of Dr. Colvin is an example of the operations that the surgeon can perform and the patient can endure. I think the patient was extremely fortunate to have fallen into the hands of a man who could follow him through his checkered career and relieve him as he went along. (By the way, the tattooed man turned out to be a fake. His tattoo marks were painted on the skin. This man is not a fake.)

The meeting adjourned.

Albert G. Schulze, M.D., *Secretary.*

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Meeting of April 2, 1936

The regular monthly meeting of the Minneapolis Surgical Society was held in the lounge of the Hennepin County Medical Society rooms on April 2, 1936. The meeting was called to order by the president, Dr. F. A. Olson, at 8:00 p. m.

The following scientific program was presented.

EXTRAPLEURAL PNEUMONOLYSIS WITH PARAFFIN PLOMBE IN THE TREATMENT OF PULMONARY TUBERCULOSIS

T. J. Kinsella, M.D.

Minneapolis

Abstract

Extrapleural pneumonolysis is not a new procedure but it has not, so far as I know, been used to any great extent in this section of the country. The original extrapleural stripping was performed by Tuffier in 1891 as a preliminary to the excision of a tuberculous nodule of the lung. Schlange in 1907 utilized a temporary extrapleural gauze pack. In 1910 Tuffier adopted the use of a permanent extrapleural fat filling and later utilized a lipoma and a resected portion of omentum for the same purpose. Jessen, in 1913, performed a bilateral operation, using a fat pack. Paraffin, as used in the present series, was first utilized by Baer of Davos in 1913. The proper term for the operation is "pneumonolysis" and not "pneumolysis" for the procedure implies a freeing of the lung and not of air.

Extrapleural thoracoplasty holds an established place in the treatment of pulmonary tuberculosis but it does present certain disadvantages which under certain circumstances may induce one to turn to some other procedure in preference to it. It is a relatively serious surgical operation, producing a certain amount of deformity of the thoracic cage. Resection of portions of even a few ribs interferes with the respiratory activity of the ribs over a rather wide area which if utilized as a bilateral procedure, might prove a rather serious handicap to the patient. Partial operations are particularly likely to prove inadequate. Extrapleural pneumonolysis is a less serious operation which, under certain circumstances, offers greater local collapse than even a radical upper thoracoplasty, with no deformity save the scar. The operation as we have used it, is performed under local anesthesia through a posterior incision the same as thoracoplasty. A 12 cm. segment of the fourth or third rib is resected subperiosteally in the paravertebral region. The periosteum of the rib bed is then incised longitudinally and the lung stripped free from the chest wall extrapleurally or extrafascially over the posterior, lateral and anterior aspects, leaving a small attachment at the apex. After control of all bleeding, this space is packed full of plastic paraffin (melting point 48° C.) containing .5 per cent iodoform, pressing the lung against the vertebral column. The periosteal bed and intercostal muscles are then closed in two separate layers, and the external wound closed the same as in any thoracoplasty procedure.

Extrapleural pneumonolysis should never be attempted in the presence of any free pleural space or over a very large peripheral cavity, if rupture of the pack into the pleural cavity or lung is to be avoided.

To date we have utilized this procedure very cautiously in a small group of patients presenting small isolated apical cavities either unilateral or bilateral, in the presence of some type of contralateral collapse, in an attempt to conserve as much breathing space as possible and also in patients who are not particularly good

risks for thoracoplasty. The use of very large packs has been avoided, the average size being 285 grams with a maximum of 440 and a minimum of 188 grams. Thus far, with the first oepration performed a little over two years ago, we have not encountered infection, extrusion of the pack, migration of the paraffin, or perforation of the lung. The procedure has now been used thirteen times on eleven patients as follows: In three presenting contralateral collapse; in two as a primary, bilateral procedure; in one as the first stage of a contemplated bilateral operation; in four for localized apical cavities and in one who was considered unsuitable for thoracoplasty because of vascular disease. Eight of these patients, who presented positive sputum prior to operation, have become negative. Two, who were previously negative, have remained so, and only one has retained a positive sputum, which we are convinced is coming from the opposite lung. A similar procedure is contemplated on the opposite side, as he originally had bilateral apical cavities.

From this limited experience, we feel that this procedure has a definite small but valuable field of usefulness in the treatment of specially selected cases of isolated cavernous tuberculosis where a limited or bilateral collapse is desired. The field is definitely more restricted than that of extrapleural thoracoplasty which is far more valuable in extensive disease.

Discussion

DR. GRETH GARDINER, St. Paul (by invitation): I have followed Dr. Kinsella's work for a long time. I have been quite an advocate of the paraffin pack. I have not had the foresight he has had to use it. I feel as Dr. Kinsella feels, that it has a very limited usefulness. I recall that Dr. Archibald came here about seven or eight years ago and we had a patient with a bilateral apical cavity and we invited him to operate on this patient. He felt that he could not operate on the patient, but he advised what to do. On one side he advised us to put a plug of fat and on the other side to do a thoracoplasty. We proceeded to put in fat from the abdomen and the patient died from sepsis. Dr. Archibald was advised about this thing and he said that he had tried a few fat plugs, also used lipomas for extrapleural cavitation collapses.

I had occasion last fall to see Dr. Alexander in Ann Arbor and he had done a bilateral apical thoracoplasty with not a very good result. I asked him what he thought would be the thing to do and he was very enthusiastic about the paraffin pack. I have used it on four cases.

Dr. Kinsella says that his packs have not migrated. The first case, I put a pack in a young girl, twenty-five years of age; she could not stand a thoracoplasty. It was very satisfactory and she had a negative sputum. About two or three months later she returned and the pack had migrated to her neck. Here she had this great big pack in her neck. Of course, I was all ready to remove the pack from her neck. It finally went down where it belonged and stayed there. They do migrate. There have been cases on record in foreign literature where they have sloughed out and the patients have spit out paraffin. I do feel that the paraffin pack has a place. Dr. Rogers reports in 1925 two cases that had been there for fifteen years without any subsequent symptoms. The pack has no reaction as a foreign body. I still feel that it has a place, but not to take the place of thoracoplasty.

I have enjoyed what little I heard of Dr. Kinsella's discussion and I am certainly going to use a pack in certain patients.

ESSENTIAL HYPERTENSION: SURGICAL TREATMENT BY RESECTION OF SPLANCHNIC NERVE AND REMOVAL OF FIRST AND SECOND SYMPATHETIC LUMBAR GANGLIONS, AND PARTIAL RESECTION OF SUPRARENAL GLAND

ALFRED W. ADSON, M.D.
Rochester, Minnesota

Abstract

Dr. Adson described the clinical picture of essential hypertension which appears most often in the third and fourth decades, may be slow, moderate or rapid in its progress and is due to a disturbance of the neurogenic endocrine vascular mechanism.

The sudden drop in blood pressure following spinal anesthesia led to the attempt to treat hypertension by attacking the sympathetic nervous control. The part played by the endocrine gland further indicates the surgical attack on the adrenals.

The author refers to Keith's classification of essential hypertension of benign, early malignant and malignant hypertension, which although not entirely satisfactory may be used until a better one is devised.

In selecting patients amenable to surgical treatment, the rate of progression of the disease, the response to medical measures, the effects of the "cold pressure test," the age of the patient and the amount of cardiovascular and nephritic damage must be considered. Patients in the third and fourth decades, with comparatively mild symptoms but who respond on the least excitement with systolic pressure peaks of 200 or more, respond best to surgical treatment. The malignant group responds the least as the damage is more likely permanent.

The speaker described the technic of his subdiaphragmatic approach and splanchnic nerve resection with lumbar sympathectomy. In the light of Crile's and DeCourcy's work, he has resected the outer half of the suprarenal gland on each side in thirty-six cases in conjunction with the splanchnic nerve resection and removal of the lumbar ganglions.

The speaker summarized as follows:

In reviewing the postoperative results following ventral root rhizotomy and extensive subdiaphragmatic resection of splanchnic nerves with removal of the upper two sympathetic lumbar ganglions it is apparent that some patients respond in greater degree than others to vasodilating measures. Those who give short histories, who have mild symptoms, and whose blood vessels have not become sclerotic, obtain a greater drop in blood pressure than those who come for treatment late in the course of their disease.

Improvement in clinical symptoms is probably more manifest than the actual drop in blood pressure, since these patients very promptly inform us that their throbbing headache, cardiac consciousness, and precordial

distress, disappear. The ocular symptoms as well are markedly improved. Spasm of the retinal artery is less, a phenomenon which is difficult to understand since these vessels have not been denervated by either the rhizotomy or splanchnic resection. It would thus appear that part of the spasm is a defense mechanism to protect against rupture, but which also works in a vicious circle to contribute to the phenomenon of vasospasm and hypertension. The reduction of blood pressure seems to diminish the reflex stimulus, which accounts for some of the relaxation of the vessels as observed by studies of the retinal arteries in the various phases of the disease and its treatment. Retinal hemorrhages and papilledema will often disappear following sympathectomy. If the damage to the kidneys or heart or brain has not been too extensive, a moderate degree of improvement may be anticipated.

Laboratory studies reveal that there is a definite water lag during the day when the blood pressures are lower, than during the night when the patient is in a reclining position. A moderate polyuria at night may appear to compensate for the deficient excretion during the day. Excretion of dye is not influenced by low pressures. There has been no change in the sugar tolerance and also no change in the creatinine or serum sulphates. Patients with renal damage presented high values for urea immediately after operation, a condition which corrected itself by the time of dismissal four weeks after operation. The "cold pressor tests" following operation produce lower levels, with smaller variables, than they did before it. Readings of blood pressure in the various positions, such as the erect, reclining, and Trendelenburg position reveal definite hypopostural factors. The systolic blood pressure is capable of dropping to such an extent that, when the patient is standing in the upright position, syncope occurs; but, fortunately, it can be corrected by applying an abdominal supporter and adjusting the tension.

The effects of splanchnic resection and removal of the first and second lumbar ganglions are similar to those obtained by rhizotomy, except that the level of sweating and sebaceous loss and increase in surface temperature occurs at a lower level than that observed in rhizotomy. Since the level in this latter group corresponds to the first lumbar segment, this loss of sweat secretion and the vasomotor relaxation continues downward from this level to include the feet. Although it appears that the autonomic nervous system, and particularly the sympathetic, plays an important rôle, according to Cannon, in the regulation of the homeostasis of the human body, it is possible for human beings as well as experimental animals to live without its influence, in limited areas at least.

NOTE: For a detailed report of indications and surgical technic the reader is referred to an article by Dr. Adson entitled "Surgery in Its Relation to Hypertension," which appeared in *Surgery, Gynecology and Obstetrics*, for February, 15, 1936.

Discussion

DR. S. MARX WHITE.—Much consideration should be given to the conditions leading up to essential hypertension and to its effects on the whole body. Viewing this subject from the medical standpoint, I would say that the most effective attack on the problems of management is to be made not late, when malignant hypertension is imminent or in its early stages—that phase to which Dr. Adson has given such masterly attention—but in the early period when the blood pressure is labile and before fixation at the higher levels has been developed.

Management must begin with the first discovery of the fact that we are dealing with an individual with a hyper-reactive pressor mechanism, if we are to prevent or even delay the effects of such hyper reactivity on the cardiovascular system. We must be willing to give time to what one might call physiologic instruction to these patients. The best approach is to teach them what they can do for themselves and how to go about it. I would not refuse to tell them of their condition or of the state of their blood pressure as is often done, nor would I tell a patient to forget about his blood pressure. He can't forget. He can, however, be taught much about how to lower blood pressure by relaxation, and in my opinion the best way to do this is to show in his own case, by giving actual figures of his blood pressure, how effective relaxation really is. A demonstration is more effective than the discussion of a theory. Having made the demonstration, the necessity of shortening the periods when blood pressure is up and of lengthening the periods when it is down can be explained. This is of great importance in the medical approach, and I am convinced that more time and attention should be given by us to this phase of management.

What I like most about Dr. Adson's contribution is that adequate study is given in his cases to the complete study of the cases before operation is attempted, and afterward as well. The operation is mutilating to the nervous system and no cases should be subjected to it unless such studies can be made, for we must know the benefits and the hazards at the earliest possible time and not spend many years during which a needless number of patients are subjected to it before final judgment as to its place in our armamentarium is made. The operation should not be widely attempted until, or unless, its benefits are known to far exceed its undesirable effects. It does not belong in the hands of every man capable of finding and removing a part of the sympathetic nervous system, but only in the hands of those trained in this field and so situated as to make thorough and decisive studies of every phase of the physiologic and pathologic basis before and long after the operation is performed.

DR. C. B. WRIGHT.—I appreciate very much the opportunity to hear this very interesting paper. Both his reasoning and results are worthy of careful consideration.

I also appreciate the invitation to discuss the paper but having had no opportunity to observe the results of this operative treatment I can add nothing to its discussion.

Judging from my own experience it would seem difficult to select the group which should be operated on. If only those patients should be operated on who are young, who are having headaches and eye changes and yet have no generally developed arteriosclerosis, it narrows it down to a comparatively small group. There are so many causes of headache and eye change is so often a late manifestation of hypertension we will undoubtedly have to develop a more accurate differentiation of cases and the patients who are to be operated upon certainly demand exceedingly careful clinical differentiation and the most expert surgery.

In the management of hypertension in general I have felt that in many cases of chronic hypertension undoubtedly anxiety and fear accentuate the condition. Every patient is an individual and should be treated

individually. Minimizing to the patient the seriousness of his hypertension provided he will observe the necessary rules of health adds to his comfort and may help keep the pressure down. In general the hygiene of the nervous system, the reduction of weight to normal, without too radical change in the patients habits of life are advisable.

I have one patient who always talks about his "million dollar blood pressure test." Some ten years ago he was advised to give up an active business and rest because of hypertension. He still has his hypertension and nothing to do but think about his blood pressure. He constantly regrets that he gave up his business which was the one thing he enjoyed and he is convinced that it cost him a million dollars to do it.

In conclusion, I again wish to thank the Surgical Society for the opportunity to hear this masterly presentation.

DR. ARCHIE H. BEARD.—So many people with nonessential hypertension are overweight. Has Dr. Adson any statistics on the basal metabolic rates in malignant hypertension? The few cases I have seen have never had a low metabolism.

DR. A. A. ZIEROLD.—There is little, if anything, that I can add by way of discussion. It would seem from the nature and extent of Dr. Adson's operation that some direct effect upon adrenal function might be expected. I would like to ask whether or not any quantitative studies of blood adrenalin have been made before and after operation.

DR. O. H. WANGENSTEEN.—This presentation of Dr. Adson has been most stimulating and indicates the physiologic trend that is becoming more apparent in surgery.

My associate, Dr. Peyton, does these operations at the University Hospital and I have little first-hand knowledge of the matter. A discussion of this sort well demonstrates that the borders of medicine and surgery are not fixed. We are continuously striving to cure by radical measures diseases which are not amenable to medical treatment; at the same time, search is always in progress for conservative agents which may serve as effectual substitutes for operative treatment.

If the results which Dr. Adson and his associates and others who have concerned themselves with the relief of hypertension by surgical means are borne out over long periods of observation, a great boon will be afforded a large number of people who are threatened to be afflicted with this disease. Certainly, a surgical approach to the problem of hypertension is fully warranted in that no specific or great promise can be held out to sufferers by medical management. The vagaries of the disease are multiple and which cases should be subjected to surgery will have to be determined by the combined experience of internists and surgeons in clinics which essay to make critical observations concerning the efficacy of surgical measures of relief. As Dr. White has intimated, not every surgeon who can operate should do these operations. Until the virtue of the method is definitely established, their performance should be concentrated in a few hands who make this field one of special interest.

In 1927, when Dr. George Eitel, of this Society, and I were at Berne in the Surgical Clinic of Professor deQuervain, we went to visit the clinics in Freiberg and had the opportunity of hearing Professor Aschoff discuss the pathological aspects of hypertension. He said that in early cases the blood vessels to five organs were essentially involved, viz., the kidneys, pancreas, liver, heart, and brain. He did not speak especially of a spastic affliction of those vessels. If in its early stages hypertension should prove to be largely a spastic nervous phenomenon, one can readily understand that denervation of the blood vessels to organs which offer an undue resistance to blood-inflow may obviate the evil consequences of the disease. There are a large number of questions which remain to be answered, before the exact mode of how this procedure works can be fully understood. Whereas, severance of the spinal cord in the lower cervical or upper dorsal region accompanying fractures of the spine does not materially affect the blood pressure, the decreases which are obtained in patients with hypertension with the employment of anesthesia or splanchnic operations suggests definitely that a spastic component is present. Whether the removal of this spastic element to the vessels of the abdominal viscera will satisfactorily interrupt similar alleged spasm in the coronary or cerebral vessels remains to be seen. The procedure obviously presents many significant physiological questions which only observation will adequately answer. If the operation proves to be very effectual in the treatment of hypertension, it will probably be found that it is more than a mechanical shunt into a large vascular bed whose inflow-resistance has been reduced.

It occurs to me that this type of medical meeting in which persons with like interests—surgeons and internists gather to discuss a controversial problem of mutual concern from their different points of view, is the gathering of the future. Harvey Cushing has well said that a surgeon must strive to become a physician in his field of interest and an internist is a better physician if he knows something of surgery.

DR. J. M. HAYES.—I have nothing to add to Dr. Adson's excellent discussion of this subject. I have, for several years, watched Dr. Adson's work in this line. I have been much interested in his progress in this unexplored field. There is no doubt but what he has added much to this field: surgery of the sympathetic nervous system. He has developed a technic in his approach to this field, which is not excelled in this or any other country.

It is interesting to see what he has done to these hypertension patients. We know they are offered but little help in any other way, so the path is clear. We hope this procedure gives them at least some hope of relief.

I join with the other men here tonight in congratulating him on his good work and the excellent presentation of the whole subject.

E. A. REGNIER, *Secretary.*

Meeting of May 1936

The regular monthly meeting of the Minneapolis Surgical Society was held in the lounge of the Hennepin County Medical Society rooms in May, 1936. The meeting was called to order by the president, Dr. F. A. Olson.

The following paper by Dr. J. M. Hayes comprised the scientific program:

HYPERTHYROIDISM IN CHILDREN

J. M. HAYES, M.D.
Minneapolis

As you all know hyperthyroidism in young children is not common. For that reason perhaps it is frequently not recognized readily when encountered. It is more common during the adolescent age than below the age

of ten. Frequently we see girls about the adolescent age of a nervous temperament, high strung and irritable in whom a diagnosis of hyperthyroidism is made. Closer study may prove that there is no hyperthyroidism present. Helmholz called attention to the fact that these children usually have the true exopthalmic type of goiter and not a toxic adenoma.

The case I have to present this evening is especially interesting to me as it is the first patient of my own under the age of ten years, to have a basal metabolic rate of more than plus 50 per cent.

About twenty years ago Sattler reported, 184 toxic goiters in children under the age of seventeen years, in a total series of 3,477. The majority of these were close to the adolescent age.

Green and Moore of Richter's Clinic reported twenty-six cases. Only one of these twenty-six cases was below the age of ten years.

Dinsmore of the Cleveland Clinic reported forty-eight cases in 1932. Nine of these were below the age of ten years. Helmholz of the Mayo Clinic reported thirty cases: four boys and twenty-six girls. This seems to be a fair representation of the ratio between boys and girls with this condition. Only a small number of these were under the age of ten years. He cites one case in which a typical hyperthyroidism existed in a boy at the age of three years.

White calls attention to a case of hyperthyroidism in a new born baby. The mother had hyperthyroidism.

A study of the literature seems to indicate that very few young children have a basal metabolic rate as high as plus 50 per cent. The average of Helmholtz's series was plus 34.6 per cent. Because of the uncertainty of the thyroid tissue in children, Lahey advises doing operating upon them in stages, first doing a partial lobectomy on one side, and then waiting six weeks or so.

Young people need thyroid tissue much more than older people. Frequently it is very uncertain just how much we should leave and how much we should take out. There is no doubt but what Lugol's solution is as effective in children as it is in adults.

Case Report

The girl I have to present tonight is nine years old. She had the typical symptoms of a hyperthyroidism that we find in an adult. The mother said these symptoms gradually came on for three years. The most marked symptoms with her were her inability to do work and to get along with other children, her parents or teachers. After playing outside for a short time she would come in all tired out and perspiring freely. Her work was so poor in school that the teacher advised her to quit at Christmas time, which she did. Even with plenty of rest and very little exertion her disposition seemed such that the other children could not get along with her. In spite of rest and small doses of Lugol's solution her symptoms seemed to increase.

This patient came to us last July and we gave her five minims of Lugol's solution, three times a day. The basal metabolic rate dropped from plus 51 per cent to plus 20 per cent in a short time.

This child had had tonsilitis every year up to last year, when her tonsils were removed. She had weighed sixty-seven pounds in September and fifty-two pounds, two months later, a loss of fifteen pounds. The mother said she felt her heart after slight exercise and it seemed to be pounding hard. She also complained of pain in her legs. The appetite was poor in this case.

I operated upon her last August and, of course, was much concerned about how much tissue to remove. She lived far away and probably would not come back if the operation did not clear up her symptoms. Her symptoms were so marked I felt considerable tissue would have to be removed. I left about the same amount of tissue we leave in the average adult, between one-fifth to one-sixth the size of a normal lobe.

The result has been so good that I haven't had much trouble getting her back for observation. Today her basal metabolic rate is minus 2 per cent. Most of the time she is as you see her here now, a happy, smiling girl. Before operation she would seldom smile. The sudden change in her personality was very marked. The nurses and the mother remarked about it only a few days after the operation.

Dinsmore calls attention to the unsightly scars we frequently get in children but as you see we were fortunate here in getting a very fine scar.

This girl is now back in school doing satisfactory work and apparently is congenial with everyone with whom she comes in contact.

E. A. REGNIER, *Secretary.*

The Greater Evil

Why the medical profession as a whole should be opposed to socialized medicine is apparent to any layman who will take the trouble to study propaganda in its behalf. Dr. Terry M. Townsend, chairman of the committee on Medical Trends of the State Medical Society, presents some aspects calculated to cause concern to the layman on his own account. He has this to say:

If the public does not awake . . . they are likely to have foisted on them a system by which they will be subjected to a pay roll tax for medical service. In addition the workingman will be required to contribute to the support of an army of clerks, supervisors, statisticians, "health study experts," snoopers, arguers and propagandists. Their job will be to entrench themselves on the public pay roll, interfere with the doctor as much as possible to make themselves important, and spend a large part of their time keeping in right with the bureaucrats above them. America does not need and does not want a medical system run by non-medical people who could not tell the difference between an X-ray and an electrocardiogram.

Dr. Townsend adds that wherever compulsory health insurance is in operation vital statistics prove that the health of the people there is below the standard now existing in the United States. Laymen might not know about that, but the layman who has ever before come into contact with the squirts, whippersnappers and nosey parkers who invariably attach themselves to bureaucracy understands the rest of it right enough. It is bad enough now for a poor man to go into some clinics to be handled by a sprout just out of medical college as if he were a parcel of none-too-welcome merchandise. What it would be under socialized medicine masquerading as compulsory health insurance is something upon which it is painful to reflect.

It is perhaps true that the health of the general public is no better than it should be. But it is by no means certain that public health under socialized medicine would be much better than it is. A greater evil, however, than indifferent health is the growth of the noxious spirit of bureaucracy.—*New York Sun,* Feb. 2, 1937.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

SYNOPSIS OF PEDIATRICS. John Zahorsky, A.B., M.D., F.A.C.P. Professor of Pediatrics and Director of Department of Pediatrics, St. Louis University School of Medicine, and Pediatrician-in-Chief St. Mary's Group of Hospitals, etc. 367 pages. Illus. Price, flexible binding, $4.00. St. Louis: C. W. Mosby Co., 1937.

MEDICAL UROLOGY. Irvin S. Koll, B.S., M.D., F.A.C.S. Attending Urologist, Michael Reese Hospital. 431 pages. Illus. Price, cloth, $5.00. St. Louis: C. V. Mosby Co., 1937.

SEXUAL POWER. Chester Tilton Stone, M.D. Clinical Assistant Surgeon in the Urological Department, Bellevue Hospital, etc. 172 pages. Price, cloth, $1.50. New York: D. Appleton-Century Co., 1937.

PHYSIOLOGY IN HEALTH AND DISEASE. Carl J. Wiggers, M.D. Professor of Physiology in the School of Medicine, Western Reserve University, Cleveland, Ohio. 1124 pages. Illus. Price, cloth, $9.00. Philadelphia: Lea & Febiger, 1937.

HANDBOOK OF ORTHOPÆDIC SURGERY. Alfred Rives Shands, Jr., B.A., M.D. Associate Professor of Surgery in Charge of Orthopædic Surgery, Duke University School of Medicine, etc. In collaboration with Richard Beverly Raney, B.A., M.D., Instructor in Orthopædic Surgery, Duke University. 593 pages. Illus. Price, cloth, $5.00. St. Louis: C. V. Mosby Co., 1937.

SURGICAL PATHOLOGY OF THE THYROID GLAND. Arthur E. Hertzler, M.D., Surgeon to the Agnes Hertzler Memorial Hospital, Halstead, Kansas, Professor of Surgery, University of Kansas. 298 pages. Illus. Cloth binding, $5.00. Philadelphia: J. B. Lippincott Co., 1937.

THE THYROID AND ITS DISEASES. J. H. Means, M.D., Jackson Professor of Clinical Medicine, Harvard University, and Chief of Medical Services, Massachusetts General Hospital. 602 pages. Illus. Cloth binding, $6.00. Philadelphia: J. B. Lippincott Co., 1937.

A MANUAL OF OPERATING ROOM PROCEDURES. Almira W. Hoppe, Science Instructor Jewish Hospital of St. Louis, and Lucile M. Halverson, Supervisor of Operating Rooms, University of Minnesota Hospitals. 239 pages including blank memorandum pages. Price, $2.00, spiral binding. Minneapolis: University of Minnesota Press, 1937.

DIABETES. A Modern Manual. Anthony M. Sindoni, Jr., M.D. Chief of Diseases of Metabolism of St. Agnes Hospital, etc. Introduction by Morris Fishbein, M.D. 240 pages. Price, cloth, $2.00. New York: Whittlesey House, McGraw-Hill Book Co., 1937.

AMERICAN MEDICINE: EXPERT TESTIMONY OUT OF COURT. 2 volumes. Price $3.50. New York: The American Foundation, 1937.

Anyone desiring to learn what medical men throughout the country think about medical economic problems can obtain this information in this work just published.

The American Foundation was established in 1924 by the late Edward Bok and devoted its activities to governmental problems until this present task was begun some eighteen months ago. Letters were sent out to 5,000 medical men, general practitioners, surgeons, specialists, educators, hospital administrators and others, and some 1300 pages of the two-volume report are devoted to the opinions of the 2100 persons who answered the various queries. The compilers have wisely made no attempt to draw conclusions from the opinions submitted. Who could? The subject is as controversial as the whole subject of economics itself.

After a perusal of these two volumes one derives certain impressions provided he doesn't become entirely confused from the many, ofttimes conflicting opinions expressed. The main problem is how to provide for good medical care for everybody in the country. The answer involves the training of good doctors and a wage scale which will permit all but the indigent to pay for medical care which in a certain percentage of cases is admittedly expensive. Human as well as economic factors enter the picture—shortcomings in members of the profession and the laity alike. Failure to save or budget for medical care, foolish waste of money on cosmetics, liquor, tobacco and amusements, patent medicines, medical cults—all play a part.

It seems pretty well agreed that different parts of the country have different medical problems which must be met locally and not by national provision; that state medicine will result in lowering of the quality of medical service and further enormous increase in taxation; that the present high taxation of wealth will affect the welfare of all medical institutions dependent on gifts from the wealthy; that the solution of medical problems is likely to be one of evolution with the state probably assisting more than at present in providing laboratory facilities and medication.

These volumes contain a wealth of material of interest to medical men in their attempt to offer constructive recommendations to meet present-day medical problems. It remains to be seen whether the survey will prove to be of any more practical value than the report of the Committee on the Cost of Medical Care.

C. B. D.

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Miller, H. A.....Fairmount
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Raymond, J. H.....Triumph
Rowe, W. H.....Fairmount
Russ, H. H.....Blue Earth
Sommer, A. W.....Elmore
Sybilrud, H. W.....Bricelyn
Thayer, E. A.....Truman
Vaughan, V. M.....Truman
Virnig, M. P.....Wells
Wells, W. B.....Sherburn
Wilson, C. E.....Blue Earth
Zemke, E. E.....Fairmount

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle and Yellow Medicine Counties

Regular meetings, every second Thursday in Fall and Spring
Annual meeting, March
Number of Members: 23

President
Johnson, C. M.....Dawson

Secretary
Westby, Nels.....Madison

Bacon, R. S.....Montevideo
Bergh, L. N.....Montevideo
Burns, F. M.....Milan
Burns, M. A.....Milan
Cress, E. E.....Boyd
Foshager, H. T.....Clara City
Hauge, M. I.....Clarkfield
Hauge, M. M.....Clarkfield
Herbert, W. L.....Granite Falls
Holmberg, L. J.....Canby
Johnson, C. M.....Dawson
Jordan, L. S.....Granite Falls
Kath, R. H.....Wood Lake
Lee, W. N.....Madison
Lima, Ludvig.....Montevideo
Nelson, M. S.....Granite Falls
Olson, W. P.....Gaylord
Pertl, A. L.....Canby
Roust, H. A.....Montevideo
Smith, L. G.....Montevideo
Tangen, G. M.....Canby
Westby, Magnus.....Madison
Westby, Nels.....Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Regular meetings, three annually
Annual meeting, December
Number of Members: 22

President
Ellingson, A. R.....Detroit Lakes

Secretary
Flancher, L. H.....Lake Park

Aborn, W. H.....Hawley
Bergheim, M. C.....Hawley
Carman, J. E.....Detroit Lakes
Duncan, J. W.....Moorhead
Ellingson, A. R.....Detroit Lakes
Flancher, L. H.....Lake Park
Gosslee, G. L.....Moorhead
Gunderson, R. M.....Lake Park
Hagen, O. J.....Moorhead
Haight, G. G.....Audubon
Humphrey, E. W.....Moorhead
Ingebrigtson, E. K.....Moorhead
Larsen, O. O.....Detroit Lakes
Larson, Arnold.....Detroit Lakes
Moberg, C. W.....Lake Park
Rice, H. G.....Moorhead
Rutledge, L. H.....Detroit Lakes
Simison, C. W.....Hawley
Soine, T. S.....Barnesville
Stafne, W. A.....Moorhead
Thysell, F. A.....Moorhead
Thysell, V. D.....Hawley

DAKOTA COUNTY MEDICAL SOCIETY

Regular meetings on call
Annual meeting December
Number of members: *(Not yet reported)*

President
Peck, L. D.....Hastings

Secretary
Burns, L. S.....South St. Paul

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties
Annual meeting, November
Number of Members: 32

President
Stratte, A. K.....Pine City

Secretary
Ness, C. M.....Cambridge

Arends, A. L.....Askov
Blomberg, W. R.....Princeton
Blumenthal, J. S....Columbia Heights
Bossert, C. S.....Mora
Brown, R. W.....Cambridge
Brownstone, Manuel.....Sandstone
Callahan, F. F.....Pokegama
Cooney, H. C.....Princeton
Dedolph, T. H.....Braham
Dredge, H. P.....Sandstone
Halpin, J. E.....Rush City
Hedenstrom, L. H.....Cambridge
Holmes, A. E.....Rush City
Johnson, D. L.....Cambridge
Kelsey, C. G.....Hinckley
Kemp, M. W.....Anoka
Kooiker, H. J.....Hill City
McBroom, D. E.....Cambridge
Ness, C. M.....Cambridge
Nordman, W. F.....Mora
Norrgard, H. T.....Milaca
Nygren, W. T.....Braham
Petersen, P. C.....Braham
Peterson, A. A.....Mora
Roehlke, A. B.....Elk River
Schlesselman, George.....Anoka
Spurzem, R. J.....Anoka
Stephan, E. L.....Hinckley
Stratte, A. K.....Pine City
Swensen, R. G.....Harris
Vik, Melvin.....Onamia
Wahlberg, E. W.....Isle

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly
Annual meeting, December
Number of Members: 21

President
Branham, D. S.....Albert Lea

Secretary
Gamble, P. M.....Albert Lea

Barr, L. C.....Albert Lea
Branham, D. S.....Albert Lea
Burns, H. D.....Albert Lea
Butturff, C. R.....Freeborn
Calhoun, F. W.....Albert Lea
Donovan, D. L.....Albert Lea
Folken, F. G.....Albert Lea
Freeman, J. P.....Albert Lea
Freligh, W. P.....Albert Lea
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gullixson, A.....Albert Lea
Jerome, Bourne.....Emmons
Kaasa, L. J.....Albert Lea
Kamp, B. A.....Albert Lea
Leopard, B. A.....Albert Lea
Merrit, W. A.....Albert Lea
Palmer, C. F.....Albert Lea
Palmer, W. L.....Albert Lea
Schultz, J. A.....Albert Lea
Whitson, S. A.....Alden

GOODHUE COUNTY MEDICAL SOCIETY

Regular meetings, none
Annual meeting, December
Number of Members: 22

President
Flom, M. G.....Zumbrota

Secretary
Juers, E. H.....Red Wing

Aanes, A. M.....Red Wing
Anderson, S. H.....Red Wing
Brusegard, J. F.....Red Wing
Claydon, D. R.....Red Wing
Claydon, H. F.....Zumbrota
Claydon, L. E.....Red Wing
Flom, M. G.....Zumbrota
Graves, R. B.....Red Wing
Hedin, R. F.....Red Wing
Johnson A. E.....Red Wing
Jones, A. W.....Red Wing
Juers, E. H.....Red Wing
Levi, Sam.....Ely
Liffrig, W. W.....Goodhue
Mack, J. J.....Fordyce, Arkansas
McGuigan, H. T.....Red Wing
Miller, F. J.....Spokane, Wash.
Odessky, Louis.....Pine River
Smith, M. W.....Red Wing
Steffens, L. A.....Red Wing
Vaaler, T.....Cannon Falls
Williams, M. R.....Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday each month excepting June, July, August and September
Annual meeting, October
Number of Members: 592

President
Simons, J. H.....Minneapolis

Secretary
Campbell, O. J.....Minneapolis

Ahrens, R. S.....Minneapolis
Alexander, H. A.....Minneapolis
Aling, C. A.....Minneapolis
Aling, C. P.....Minneapolis
Allen, H. W.....Minneapolis
Allison, R. G.....Minneapolis
Altnow, H. O.....Minneapolis
Andersen, A. G.....Minneapolis
Andersen, S. C.....Minneapolis
Anderson, D. D.....Minneapolis
Anderson, E. D.....Minneapolis
Anderson, E. R.....Minneapolis
Anderson, F. J.....Minneapolis
Anderson, J. K.....Minneapolis
Anderson, K. W.....Minneapolis
Anderson, P. A.....Minneapolis
Andreassen, E. C.....Minneapolis
Andrews, R. S.....Minneapolis
Annis, H. B.....Minneapolis
Arey, S. L.....Excelsior
Arlander, C. E.....Minneapolis
Arnold, D. C.....Minneapolis
Arvidson, C. G.....Minneapolis
Aune, Martin.....Minneapolis
Aurand, W. H.....Minneapolis
Avery, J. F.....La Jolla, Calif.
Baken, M. P.....Minneapolis
Baker, A. T.....Minneapolis
Baker, E. L.....Minneapolis
Baker, Looe.....Minneapolis
Barber, J. P.....Minneapolis
Barron, Moses.....Minneapolis

*Deceased.

Bass, G. W.....Minneapolis
Baxter, S. H.....Minneapolis
Bayard, H. F.....Minneapolis
Beard, A. H.....Minneapolis
*Beard, R. O.....Minneapolis
Beckman, W. G.....Minneapolis
Bedford, E. W.....Minneapolis
Bell, E. T.....Minneapolis
Belzer, M. S.....Minneapolis
Benjamin, A. E.....Minneapolis
Benjamin, E. G.....Minneapolis
Benjamin, H. G.....Minneapolis
Benn, F. G.....Minneapolis
Berger, A. G.....Minneapolis
Berkwitz, N. J.....Minneapolis
Bessesen, A. N., Jr.....Minneapolis
Bessesen, D. H.....Minneapolis
Bessesen, W. A.....Minneapolis
Blake, James.....Hopkins
Blaustone, H. H.....Minneapolis
Boehme, E. J.....Minneapolis
Boies, L. R.....Minneapolis
Booth, A. E.....Minneapolis
Boquist, E. T. W.....Minneapolis
Boreen, C. A.....Minneapolis
Borgeson, E. J.....Minneapolis
Bouman, H. A. H.....Minneapolis
Boynton, Ruth.....Minneapolis
Bracken, H. M.....Claremont, Calif.
Bratrud, A. F.....Minneapolis
Brekke, H. J.....Minneapolis
Brick, E. B.....Minneapolis
Brooks, C. N.....Minneapolis
Brown, E. D.....Minneapolis
Brown, E. J.....Minneapolis
Brutsch, G. C.....Minneapolis
Bryant, F. L.....Minneapolis
Bryant, O. R.....Minneapolis
Bulkley, Kenneth.....Minneapolis
Bullard, M. J.....Minneapolis
Butler, John.....Minneapolis
Buzzelle, L. K.....Minneapolis
Cable, M. L.....Minneapolis
Cabot, V. S.....Minneapolis
Cady, L. H.....Minneapolis
Callerstrom, G. W.....Minneapolis
Cameron, Isabell.....Minneapolis
Camp, W. E.....Minneapolis
Campbell, L. M.....Minneapolis
Campbell, O. J.....Minneapolis
Cardle, A. E.....Minneapolis
Carey, J. B.....Minneapolis
Carlson, H. A.....Minneapolis
Carlson, Lawrence.....Minneapolis
Carlson, L. T.....Minneapolis
Caron, R. P.....Minneapolis
Cavanor, F. T.....Minneapolis
Chesley, A. J.....Minneapolis
Christenson, G. R.....Minneapolis
Christianson, H. W.....Minneapolis
Clark, H. S.....Minneapolis
Cohen, S. S.....Oak Terrace
Condit, W. H.....Minneapolis
Cook, H. W.....Minneapolis
Cooperman, H. O.....Minneapolis
Corbett, J. F.....Minneapolis
Corniea, A. D.....Minneapolis
*Cosman, E. O.....Minneapolis
Cottam, Gilbert.....Minneapolis
Crafts, L. M.....Minneapolis
Cranmer, R. R.....Minneapolis
Cranston, R. W.....St. Louis Park
Creevy, C. D.....Minneapolis
Creighton, R. H.....Minneapolis
Curtin, J. F.....Minneapolis
Cutts, George.....Minneapolis
Cutts, R. E.....Minneapolis
Dady, E. E.....Minneapolis

Dahl, E. O. ..... Minneapolis
Dahl, J. A. ..... Minneapolis
Daniel, D. H. ..... Minneapolis
Daniel, L. M. ..... Minneapolis
Dart, L. O. ..... Minneapolis
Davis, J. C. ..... Minneapolis
del Plaine, C. W. ..... Minneapolis
Devereaux, T. J. ..... Wayzata
Diehl, H. S. ..... Minneapolis
Diessner, H. D. ..... Minneapolis
Doering, R. E. ..... Minneapolis
Dorge, R. I. ..... Minneapolis
Dornblaser, H. B. ..... Minneapolis
Dorsey, G. C. ..... Minneapolis
Doxey, G. L. ..... Minneapolis
Doyle, L. O. ..... Minneapolis
Drake, C. R. ..... Minneapolis
Drill, H. E. ..... Hopkins
Duff, E. R. ..... Minneapolis
Dukelow, D. A. ..... Minneapolis
Dumas, A. G. ..... Minneapolis
Dunlap, E. H. ..... Minneapolis
Dunn, G. R. ..... Minneapolis
Duryea, W. M. ..... Minneapolis
Dutton, C. E. ..... Minneapolis
Dvorak, B. A. ..... Minneapolis
Dwan, P. F. ..... Minneapolis
Dworsky, S. D. ..... Minneapolis
Ehrenberg, C. J. ..... Minneapolis
Ehrlich, S. P. ..... Minneapolis
Eich, Matthew ..... Minneapolis
Eiler, John ..... St. Bonifacius
Eisenstadt, D. H. ..... Minneapolis
Eitel, G. D. ..... Minneapolis
Ellison, D. E. ..... Minneapolis
Engstrand, O. J. ..... Minneapolis
Erdmann, C. A. ..... Minneapolis
Erickson, R. F. ..... Minneapolis
Ericson, R. M. ..... Minneapolis
Evans, E. T. ..... Minneapolis
Evans, R. D. ..... Minneapolis
Fahr, G. E. ..... Minneapolis
Fansler, W. A. ..... Minneapolis
Feeney, J. M. ..... Minneapolis
Fenger, E. P. K. ..... Oak Terrace
Fetterly, Warren ..... Minneapolis
Fink, L. W. ..... Minneapolis
Fink, W. H. ..... Minneapolis
Fitzgerald, D. F. ..... Minneapolis
Fjeldstad, C. A. ..... Minneapolis
Fleming, A. S. ..... Minneapolis
Ford, W. H. ..... Minneapolis
Foster, W. K. ..... Minneapolis
Fowler, L. H. ..... Minneapolis
Fredericks, G. M. ..... Minneapolis
Friedell, Aaron ..... Minneapolis
Fritzell, K. E. ..... Minneapolis
Froehlich, H. W. ..... Minneapolis
Funk, V. K. ..... Oak Terrace
Gammell, J. H. ..... Minneapolis
Gardner, E. L. ..... Minneapolis
Giere, E. O. ..... Minneapolis
Giere, J. C. ..... Minneapolis
Giere, R. W. ..... Minneapolis
Giessler, P. W. ..... Minneapolis
Gilles, F. L. ..... Minneapolis
Gingold, B. A. ..... Minneapolis
Ginsberg, Harry ..... Minneapolis
Girvin, R. B. ..... Minneapolis
Golberg, M. L. ..... Minneapolis
Goldman, T. I. ..... Minneapolis
Good, H. D. ..... Minneapolis
Gratzek, F. R. ..... Minneapolis
Grave, Floyd ..... Minneapolis
Gray, R. C. ..... Minneapolis
*Green, E. K. ..... Minneapolis
Grimes, B. P. ..... Minneapolis
Grimes, Marian ..... Minneapolis
Gronvall, P. R. ..... Minneapolis
Gunderson, N. A. ..... Minneapolis
Gustason, H. T. ..... Minneapolis
Haggard, G. D. ..... Minneapolis
Hall, J. M. ..... Minneapolis
Hallberg, C. A. ..... Minneapolis
Hamel, A. L. ..... Minneapolis
Hamilton, A. S. ..... Minneapolis
Hamlin, G. B. ..... Minneapolis
Hammond, A. J. ..... Minneapolis
Hannah, H. B. ..... Minneapolis
Hansen, C. O. ..... Minneapolis
Hansen, E. W. ..... Minneapolis
Hansen, O. S. ..... Minneapolis
Hanson, H. J. ..... Minneapolis
Hanson, H. V. ..... Minneapolis
Hanson, W. A. ..... Minneapolis
Harrington, C. D. ..... Minneapolis
Harrington, F. E. ..... Minneapolis
Hart, V. L. ..... Minneapolis
Hastings, D. R. ..... Minneapolis
Haugen, J. A. ..... Minneapolis
Haverfield, A. R. ..... Minneapolis
Hawkinson, R. P. ..... Robbinsdale
Hayes, J. M. ..... Minneapolis
Head, D. P. ..... Minneapolis
Head, G. D. ..... Minneapolis
Hedback, A. E. ..... Minneapolis
Heim, R. R. ..... Minneapolis
Helk, H. H. ..... Minneapolis
Hendricks, E. J. ..... Minneapolis
Hendrickson, J. F. ..... Minneapolis
Henrikson, E. C. ..... Minneapolis
Henry, C. E. ..... Minneapolis
Henry, M. O. ..... Minneapolis
Herbolsheimer, A. J. ..... Minneapolis
Herbst, R. F. ..... Minneapolis
Herman, A. L. ..... Minneapolis
Hiebert, J. P. ..... Minneapolis
Higgins, J. H. ..... Minneapolis
Hill, E. J. ..... Minneapolis
Hirschfelder, A. D. ..... Minneapolis
Hirshfield, F. R. ..... Minneapolis
Hoaglund, A. W. ..... Minneapolis
Hobbs, C. A. ..... Minneapolis
Hodge, S. V. ..... Minneapolis
Hoffert, H. E. ..... Minneapolis
Holl, P. M. ..... Minneapolis
Holt, W. B. ..... Minneapolis
Houkom, Bjarne ..... Minneapolis
Hovland, M. L. ..... Minneapolis
Howard, W. H. ..... Minneapolis
Huenekens, E. J. ..... Minneapolis
Hultkrans, R. E. ..... Minneapolis
Hurd, Annah ..... Minneapolis
Hutchinson, C. J. ..... Minneapolis
Hymes, Charles ..... Minneapolis
Hynes, J. E. ..... Minneapolis
Irvine, H. G. ..... Minneapolis
Jackson, C. M. ..... Minneapolis
Jacobs, L. G. Jr. ..... Madison, Wis.
Jennings, F. L. ..... Oak Terrace
Jennings, M. H. ..... Minneapolis
Jensen, Harry ..... Minneapolis
Jensen, M. J. ..... Minneapolis
Johnson, A. B. ..... Minneapolis
Johnson, A. E. ..... Minneapolis
Johnson, E. W. ..... Minneapolis
Johnson, H. A. ..... Minneapolis
Johnson, J. A. ..... Minneapolis
Johnson, Julius ..... Minneapolis
Johnson, N. A. ..... Minneapolis
Johnson, Norman ..... Minneapolis
Johnson, N. T. ..... Minneapolis
Johnson, R. A. ..... Minneapolis
Johnson, S. M. ..... Minneapolis
Johnson, Y. T. ..... Minneapolis
Johnston, L. F. ..... Minneapolis
Jones, G. M. ..... Minneapolis
Jones, H. W. ..... Minneapolis
Jones, W. R. ..... Minneapolis
Josewich, Alexander ..... Minneapolis
Kalin, O. T. ..... Minneapolis
Kelby, G. M. ..... Minneapolis
Kennedy, C. C. ..... Minneapolis
Kennedy, J. F. ..... Minneapolis
Kerkhof, A. C. ..... Minneapolis
Kertesz, G. ..... Minneapolis
Kibbe, O. A. ..... Minneapolis
King, E. A. ..... Minneapolis
King, H. T. ..... Minneapolis
Kinsella, T. J. ..... Minneapolis
Kistler, A. J. ..... Minneapolis
Kistler, C. M. ..... Minneapolis
Knapp, M. E. ..... Minneapolis
Knight, R. R. ..... Minneapolis
Knight, R. T. ..... Minneapolis
Koepcke, G. M. ..... Minneapolis
Koller, H. M. ..... Minneapolis
Koller, L. R. ..... Minneapolis
Kucera, F. J. ..... Hopkins
Kucera, W. J. ..... Minneapolis
Lajoie, J. M. ..... Minneapolis
Lamont, J. G. ..... Minneapolis
Lang, L. A. ..... Minneapolis
Lapierre, A. P. ..... Minneapolis
Lapierre, C. A. ..... Minneapolis
Lapierre, J. T. ..... Minneapolis
Larsen, F. W. ..... Minneapolis
Larson, C. M. ..... Minneapolis
Larson, L. M. ..... Minneapolis
Larson, L. M. ..... Oak Terrace
Larson, P. N. ..... Minneapolis
La Vake, R. T. ..... Minneapolis
Laymon, C. W. ..... Minneapolis
Lazar, H. L. ..... Minneapolis
Leavitt, H. H. ..... Minneapolis
Lebowske, J. A. ..... Minneapolis
Lee, H. M. ..... Minneapolis
Leland, H. R. ..... Minneapolis
Lenz, O. A. ..... Minneapolis
Leonard, L. J. ..... Minneapolis
Leonard, Sam ..... Minneapolis
Levine, N. M. ..... Minneapolis
Lillehei, E. J. ..... Robbinsdale
Lind, C. J. ..... Minneapolis
Lindquist, R. H. ..... Minneapolis
Linner, H. P. ..... Minneapolis
Linton, W. B. ..... Minneapolis
Lippman, E. S. ..... Minneapolis
Lipschultz, Oscar ..... Minneapolis
Litman, A. B. ..... Minneapolis
Litzenberg, J. C. ..... Minneapolis
Logefeil, R. C. ..... Minneapolis
Long, Jesse ..... Minneapolis
Loomis, E. A. ..... Minneapolis
Lundblad, R. A. ..... Minneapolis
Lundgren, A. C. ..... Minneapolis
Lundquist, E. F. ..... Minneapolis
Lynch, M. J. ..... Minneapolis
Lyon, E. P. ..... Minneapolis
Lysne, Henry ..... Minneapolis
MacDonald, A. E. ..... Minneapolis
MacDonald, D. A. ..... Minneapolis
MacDonald, I. C. ..... Minneapolis
Mach, F. B. ..... Minneapolis
Macnie, J. S. ..... Minneapolis
Maland, C. O. ..... Minneapolis
Marcley, W. J. ..... Minneapolis
Mariette, E. S. ..... Oak Terrace
Mark, D. B. ..... Minneapolis
Martinson, C. J. ..... Wayzata
Matchan, G. R. ..... Minneapolis
Matthews, Justus ..... Minneapolis
Mattill, P. M. ..... Oak Terrace
Mattson, Hamlin ..... Minneapolis
Maxeiner, S. R. ..... Minneapolis
May, W. H. ..... Minneapolis
McCann, E. J. ..... Minneapolis
McCarthy, Donald ..... Minneapolis
McCartney, J. S. ..... Minneapolis
McDaniel, Orianna ..... Minneapolis
McFarland, A. H. ..... Minneapolis
McGandy, R. F. ..... Minneapolis
McGeary, G. E. ..... Minneapolis
McGregor, Catherine ..... Minneapolis
McInerny, Maurice ..... Minneapolis
McIntyre, George ..... Minneapolis
McKenzie, C. H. ..... Minneapolis
McKinlay, C. A. ..... Minneapolis
McKinley, J. C. ..... Minneapolis
McKinney, F. S. ..... Minneapolis
McPheeters, H. O. ..... Minneapolis
McQuarrie, Irvine ..... Minneapolis
Mee, P. H. ..... Osseo
Meland, E. L. ..... Minneapolis
Merkert, C. E. ..... Minneapolis
Merkert, G. L. ..... Minneapolis
Merrill, Elisabeth ..... Minneapolis
Meyer, E. L. ..... Minneapolis
Michael, J. C. ..... Minneapolis
Michel, H. H. ..... Minneapolis
Michelson, H. E. ..... Minneapolis
Miller, H. E. ..... Minneapolis
Miller, J. C. ..... Minneapolis
Milton, J. S. ..... Minneapolis
Mitchell, E. C. ..... Mound
Moe, J. H. ..... Minneapolis
Moir, W. W. ..... Minneapolis
Moorhead, M. B. ..... Minneapolis
Moren, Edward ..... Minneapolis
Moriarty, C. R. ..... Minneapolis
Morrison, A. W. ..... Minneapolis
Morse, R. W. ..... Minneapolis
Morton, H. McI. ... Vincentown, N. J.
Murphy, I. J. ..... Minneapolis
Myers, J. A. ..... Minneapolis
Neal, J. M. ..... Minneapolis
Neary, R. P. ..... Minneapolis
Nelson, H. S. ..... Minneapolis
Nelson, Harvey ..... Minneapolis
Nelson, O. E. ..... Minneapolis
Newhart, Horace ..... Minneapolis
Noonan, D. F. ..... Minneapolis
Nordin, G. T. ..... Minneapolis
Nordland, Martin ..... Minneapolis
Noth, H. W. ..... Minneapolis
Nystrom, Ruth ..... Minneapolis
Oberg, C. M. ..... Minneapolis
O'Brien, W. A. ..... Minneapolis
O'Donnell, J. E. ..... Minneapolis
Olson, F. A. ..... Minneapolis
Olson, O. A. ..... Minneapolis
Olson, R. G. ..... Minneapolis
Oppen, E. G. ..... Minneapolis
Owre, Oscar ..... Minneapolis
Parks, A. H. ..... Minneapolis
Patterson, W. E. ..... Minneapolis

*Deceased.

Paulsen, E. L. ..... Minneapolis
Pearce, N. O. ..... Minneapolis
Pennington, Reuben ..... Minneapolis
Peppard, T. A. ..... Minneapolis
Perry, R. St. J. ..... Minneapolis
Petersen, J. R. ..... Minneapolis
Petersen, Thorvald ..... Minneapolis
Peterson, Henry ..... Minneapolis
Peterson, H. W. ..... Minneapolis
Peterson, N. P. ..... Minneapolis
Peterson, O. H. ..... Minneapolis
Peterson, P. E. ..... Minneapolis
Peterson, W. C. ..... Minneapolis
Petit, L. J. ..... Minneapolis
Petter, C. K. ..... Oak Terrace
Pettit, C. W. ..... Minneapolis
Peyton, W. T. ..... Minneapolis
Pfunder, M. C. ..... Minneapolis
Phelps, K. A. ..... Minneapolis
Platou, E. S. ..... Minneapolis
Pollard, D. W. ..... Minneapolis
Pollock, D. K. ..... Minneapolis
Polzak, J. A. ..... Minneapolis
Poppe, F. H. ..... Minneapolis
Pratt, F. J. ..... Minneapolis
Pratt, J. A. ..... Minneapolis
Preine, I. A. ..... Minneapolis
Prim, J. A. ..... Minneapolis
Proshek, C. E. ..... Minneapolis
Quinby, T. F. ..... Minneapolis
Quist, H. W. ..... Minneapolis
Rasmussen, R. C. ..... St. Paul
Reed, C. A. ..... Minneapolis
Regnier, E. A. ..... Minneapolis
Rewbridge, A. G. ..... Minneapolis
Reynolds, J. S. ..... Minneapolis
Rice, C. O. ..... Minneapolis
Richardson, F. S. ..... Minneapolis
Richdorf, L. F. ..... Minneapolis
Rieke, W. W. ..... Wayzata
Rigler, L. G. ..... Minneapolis
Rishmiller, J. H. ..... Minneapolis
Rizer, R. I. ..... Minneapolis
Roan, C. M. ..... Minneapolis
Robb, E. F. ..... Minneapolis
Roberts, S. W. ..... Minneapolis
Roberts, T. S. ..... Minneapolis
Roberts, W. B. ..... Minneapolis
Robitshek, E. C. ..... Minneapolis
Rochford, W. E. ..... Minneapolis
Rodda, F. C. ..... Minneapolis
Rodgers, C. L. ..... Minneapolis
Rosen, Samuel ..... Minneapolis
Rosenwald, R. M. ..... Minneapolis
Rucker, W. H. ..... Minneapolis
Rud, N. E. ..... Minneapolis
Rudell, G. L. ..... Minneapolis
Rupp, Alice ..... Minneapolis
Russeth, A. N. ..... Minneapolis
Rusten, E. M. ..... Minneapolis
Sadler, W. P. ..... Minneapolis
St. Cyr, K. J. ..... Osseo

Saliterman, B. I. ..... Minneapolis
Salt, C. G. ..... Minneapolis
Samuelson, Samuel ..... Minneapolis
Sawatzky, W. A. ..... Minneapolis
Schaaf, F. H. K. ..... Minneapolis
Schaefer, W. G. ..... Minneapolis
Scheldrup, N. H. ..... Minneapolis
Scherer, L. R. ..... Minneapolis
Schmidt, G. F. ..... Minneapolis
Schmitt, A. F. ..... Minneapolis
Schmitt, S. C. ..... Minneapolis
Schneider, J. P. ..... Minneapolis
Schottler, M. E. ..... Minneapolis
Schultz, P. J. ..... Minneapolis
Schussler, O. F. ..... Minneapolis
Schwartz, V. J. ..... Minneapolis
Schwyzer, Gustav ..... Minneapolis
Scott, F. H. ..... Minneapolis
Scott, H. G. ..... Minneapolis
Seashore, Gilbert ..... Minneapolis
Seham, Max ..... Minneapolis
Seifert, M. H. ..... Excelsior
Selleseth, I. F. ..... Minneapolis
Shaperman, E. P. ..... Minneapolis
Shapiro, M. J. ..... Minneapolis
Sharp, D. V. ..... Minneapolis
Siegmann, W. C. ..... Minneapolis
Silver, J. D. ..... Minneapolis
Simons, J. H. ..... Minneapolis
Simpson, E. D. ..... Minneapolis
Siperstein, D. M. ..... Minneapolis
Sivertsen, Andrew ..... Hollywood, Calif.
Sivertsen, Ivar ..... Minneapolis
Skjold, A. C. ..... Minneapolis
Sloan, Julius ..... Minneapolis
Sloan, L. N. ..... Minneapolis
Smisek, F. M. ..... Minneapolis
Smith, A. E. ..... Minneapolis
Smith, A. M. ..... Minneapolis
Smith, H. R. ..... Minneapolis
Smith, N. M. ..... Minneapolis
Soderlind, R. T. ..... Minneapolis
Solhaug, S. B. ..... Minneapolis
Spano, J. P. ..... Minneapolis
Sperling, Louis ..... Minneapolis
Spratt, C. N. ..... Minneapolis
Stelter, L. A. ..... Minneapolis
Stenstrom, A. T. ..... Minneapolis
Stewart, C. A. ..... Minneapolis
Stewart, R. I. ..... Minneapolis
Stomel, Joseph ..... Minneapolis
Strachauer, A. C. ..... Minneapolis
Strout, E. S. ..... Minneapolis
Strout, G. E. ..... Minneapolis
Sturre, J. R. ..... Minneapolis
Sullivan, R. M. ..... Minneapolis
Sundt, Mathias ..... Minneapolis
Swanson, Cephas ..... Minneapolis
Swanson, R. E. ..... Minneapolis
Sweetser, H. B., Jr. ..... Minneapolis
Sweetser, H. B., Sr. ..... Minneapolis
Sweetser, T. H. ..... Minneapolis

Sweitzer, S. E. ..... Minneapolis
Swendseen, C. G. ..... Minneapolis
Taylor, J. H. ..... Minneapolis
Ternstrom, O. H. ..... Minneapolis
Thomas, G. E. ..... Minneapolis
Thomas, G. H. ..... Minneapolis
Thomas, G. J. ..... Minneapolis
Thompson, H. H. ..... Minneapolis
Tingdale, A. C. ..... Wayzata
Trueman, H. S. ..... Minneapolis
Tunstead, H. J. ..... Minneapolis
Turnacliff, D. D. ..... Minneapolis
Tyrrell, C. C. ..... Minneapolis
Ude, W. H. ..... Minneapolis
Ulrich, H. L. ..... Minneapolis
Undine, C. A. ..... Minneapolis
Vik, A. E. ..... Minneapolis
Walch, A. E. ..... Minneapolis
Wahlquist, H. F. ..... Minneapolis
Waldron, C. W. ..... Minneapolis
Wall, C. R. ..... Minneapolis
Wangensteen, O. H. ..... Minneapolis
Wanous, E. Z. ..... Minneapolis
Ward, A. W. ..... Minneapolis
Ward, P. A. ..... Minneapolis
Warham, T. T. ..... Minneapolis
Watson, J. A. ..... Minneapolis
Webb, R. C. ..... Minneapolis
Weisman, S. A. ..... Minneapolis
Westman, R. T. ..... Minneapolis
Wethall, A. G. ..... Minneapolis
Wetherby, Macnider ..... Minneapolis
Weum, T. W. ..... Minneapolis
White, A. A. ..... Minneapolis
White, S. M. ..... Minneapolis
White, W. D. ..... Minneapolis
Whitesell, L. A. ..... Minneapolis
Widen, W. F. ..... Minneapolis
Wiese, H. F. B. ..... Minneapolis
Wilcox, A. E. ..... Minneapolis
Wilder, R. L. ..... Minneapolis
Wilken, P. A. ..... Minneapolis
Willcutt, C. E. ..... Minneapolis
Williams, Robert ..... Minneapolis
Winer, L. H. ..... Minneapolis
Winther, Nora ..... Minneapolis
Witham, C. A. ..... Minneapolis
Wittich, F. W. ..... Minneapolis
Wohlrabe, A. A. ..... Minneapolis
Wohlrabe, C. F. ..... Minneapolis
Woodworth, Elizabeth ..... Minneapolis
Wright, C. B. ..... Minneapolis
Wright, C. D. ..... Minneapolis
Wright, F. R. ..... Minneapolis
Wright, S. G. ..... Minneapolis
Wyatt, O. S. ..... Minneapolis
Wynne, H. M. N. ..... Minneapolis
Ylvisaker, R. S. ..... Minneapolis
Yoerg, O. W. ..... Minneapolis
Zaworski, E. A. ..... Minneapolis
Zierold, A. A. ..... Minneapolis
Ziskin, Thomas ..... Minneapolis

KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, second Wednesday of month
Annual meeting, December
Number of Members: 33

President
Hutchinson, Henry ..... Willmar

Secretary
Scofield, C. L. ..... Benson

Anderson, L. W. ..... Atwater
Anderson, R. E. ..... Willmar
Arnson, J. M. ..... Benson
Branton, A. F. ..... Willmar
Branton, B. J. ..... Willmar
Brigham, Frank ..... Watkins
Daignault, Oscar ..... Benson

Danielson, K. A. ..... Litchfield
Danielson, Lennox ..... Litchfield
Dowswell, W. J. ..... Kerkhoven
Dulude, S. S. ..... Dassel
Edwards, G. C. ..... Grove City
Fiksdal, M. J. ..... Willmar
Fredrickson, A. C. ..... Lake Lillian
Fredrickson, G. U. Y. ..... Lake Lillian
Frisch, F. P. ..... Willmar
Frost, E. H. ..... Willmar
Giere, S. W. ..... Benson
Hedlund, C. J. ..... Atwater
Hodapp, R. J. ..... Willmar

Hutchinson, Henry ..... Willmar
Jacobs, D. L. ..... Willmar
Jacobs, J. C. ..... Willmar
Jensen, H. H. ..... Atwater
Johnson, Hans ..... Kerkhoven
Kaufman, E. J. ..... Appleton
Kaufman, W. C. ..... Appleton
Macklin, W. E. ..... Litchfield
Noble, J. L. ..... St. Paul
Petersen, M. C. ..... Willmar
Scofield, C. L. ..... Benson
Telford, V. J. ..... Litchfield
Wilmot, H. E. ..... Litchfield

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday of month
Annual meeting, November
Number of Members: 22

President
Schmidt, P. G. ..... Cottonwood

Secretary
Workman, W. G. ..... Tracy

Bossingham, O. N. ..... Lake Benton
Ford, B. C. ..... Marshall
Germo, Charles ..... Balaton
Golden, C. M. ..... Tyler

Gray, F. D. ..... Marshall
Happe, L. J. ..... Marshall
Helferty, J. K. ..... Tracy
Hermanson, P. E. ..... Hendricks
Hoidale, A. D. ..... Tracy
Jacquot, G. L. ..... Marshall
Johnson, P. C. ..... Tyler
Monson, L. J. ..... Hendricks
Persons, C. E. ..... Marshall

Purves, G. H. ..... Russell
Robertson, J. B. ..... Minneapolis
Sanderson, E. T. ..... Minneota
Schmidt, P. G. ..... Cottonwood
Thordarson, Theodore ..... Minneota
Vadheim, A. L. ..... Tyler
Valentine, W. H. ..... Tracy
Workman, W. G. ..... Tracy
Yaeger, W. W. ..... Ivanhoe

McLEOD COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly
Annual meeting, December
Number of Members: 17

President
Goss, H. C.....Glencoe

Secretary
Sahr, W. G.....Hutchinson

Clement, J. B.....Lester Prairie
Jensen, A. H.....Hutchinson

Jensen, A. M.....Brownton
Holm, H. H.....Glencoe
Goss, H. C.....Glencoe
Klima, W. W.....Stewart
Langhoff, A. H.....Glencoe
Lippmann, E. W.....Hutchinson
McMahon, M. J.....Green Isle
Ninneman, N. N.....Silver Lake

Sahr, W. G.....Hutchinson
Schmidt, W. R.....Glencoe
Scholpp, O. W.....Hutchinson
Sheppard, Fred .....Hutchinson
Sheppard, P. E.....Hutchinson
Tinker, C. W.....Stewart
Trutna, T. J.....Silver Lake

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday each month except June, July and August
Annual meeting, last Thursday in November
Number of Members: 25

President
Leck, P. C.....Austin

Secretary
Robertson, P. A.....Austin

Allen, A. W.....Austin
Allen, C. C.....Austin
Anderson, U. S.....Austin
Cronwell, B. J.....Austin
Flanagan, L. G.....Austin

Grise, W. B.....Austin
Havens, J. G. W.....Austin
Hegge, O. H.....Austin
Hegge, R. S.....Austin
Henslin, A. E.....Le Roy
Hertel, G. E.....Austin
Johnson, O. J.....Lyle
Leck, P. C.....Austin
Lommen, P. A.....Austin
McKenna, J. K.....Austin

Melzer, G. R.....Lyle
Mitchell, R. S.....Grand Meadow
Morrow, J. J.....Austin
Morse, M. P.....Le Roy
Nettrour, W. S.....Austin
Robertson, P. A.....Austin
Rosenthal, F. H.....Grand Meadow
Schottler, G. J.....Dexter
Sheedy, C. L.....Austin
Thomson, J. M.....Brownsdale

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday, April, September, and December
Annual meeting, first Tuesday in December
Number of Members: 16

President
Kerschbaumer, Louisa.....St. Peter

Secretary
Lenander, M. E.....St. Peter

Aitkens, H. B.....Le Center
Covell, W. W.....St. Peter

Curtis, R. A.....Le Center
Ericson, Swan.....Le Sueur
Freeman, G. H.....St. Peter
Gully, R. J.....St. Peter
Hiniker, P. J.....Le Sueur
Holtan, Theodore.....Waterville
Kerschbaumer, Louisa.....St. Peter

Kolars, J. J.....Le Center
Lenander, M. E.....St. Peter
Nilson, H. J.....North Mankato
Sonnesyn, N. N.....Le Sueur
Strathern, F. P.....St. Peter
Traxler, F. J.....Henderson
Wolner, O. H.....St. Peter

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Regular meetings, first Wednesday every odd month
Annual meeting in November
Number of Members: 348

President
Dixon, C. F.....Rochester

Secretary
Piper, M. C.....Rochester

Adams, R. C.....Rochester
Adson, A. W.....Rochester
Affeldt, D. E.....Kasson
Allen, E. V.....Rochester
Alvarez, W. C.....Rochester
Amberg, Samuel .....Rochester
Anderson, C. M.....Rochester
Anderson, M. J.....Rochester
Annis, J. W.....Rochester
Archer, G. F., Jr.....Rochester
Armstrong, T. D.....Rochester
Arny, F. P.....Preston
Autry, D. H.....Rochester
Baggenstoss, A. H.....Rochester
Bailey, R. J.....Rochester
Bair, H. L.....Rochester
Baker, C. P.....Rochester
Baker, G. S.....Rochester
Baker, H. R.....Hayfield
Baker, R. L.....Hayfield
Baker, T. W.....Rochester
Balfour, D. C.....Rochester
Bannick, E. G.....Rochester
Bargen, J. A.....Rochester
Barker, N. W.....Rochester
Barnes, A. R.....Rochester
Batts, Martin, Jr.....Rochester
Bedard, R. E.....Rochester
Behrend, Albert .....Rochester
Beiswanger, R. H.....Wykoff
Belote, G. B.....Caledonia
Benedict, W. L.....Rochester
Benson, K. W.....Rochester
Berkman, D. M.....Rochester
Berkman, J. M.....Rochester
Betlach, C. J.....Rochester
Bigelow, C. E.....Dodge Center
Binger, M. W.....Rochester
Birge, H. L.....Rochester
Blake, T. W.....Rochester
Blum, B. B.....Rochester

Boothby, W. M.....Rochester
Bowing, H. H.....Rochester
Braasch, W. F.....Rochester
Breck, L. W.....Rochester
Brink, J. R.....Rochester
Broders, A. C.....Rochester
Brown, A. E.....Rochester
Brown, P. W.....Rochester
Brunsting, H. A.....Rochester
Brunsting, L. A.....Rochester
Buchstein, H. F.....Rochester
Buchtel, H. A.....Rochester
Buie, L. A.....Rochester
Bussey, C. D.....Rochester
Butsch, W. L.....Rochester
Butt, H. R.....Rochester
Cabot, Hugh .....Rochester
Camp, J. D.....Rochester
Campbell, S. J.....Rochester
Carlson, L. A.....Rochester
Carmichael, F. A., Jr.....Rochester
Chew, E. M.....Rochester
Childrey, Edgar, Jr.....Rochester
Clagett, O. T.....Rochester
Clark, L. W.....Spring Valley
Clark, R. L., Jr.....Rochester
Cleveland, W. H.....Rochester
Clifton, T. A.....Chatfield
Coffey, R. J.....Rochester
Comfort, M. W.....Rochester
Conner, H. M.....Rochester
Cook, E. N.....Rochester
Corwin, W. C.....Rochester
Counseller, V. S.....Rochester
Cragg, R. W.....Rochester
Craig, W. McK.....Rochester
Crenshaw, J. L.....Rochester
Crewe, J. E.....Rochester
Cusick, P. L.....Rochester
Cutler, H. H.....Rochester
Davenport, L. H.....Rochester
Davis, A. C.....Rochester
Davis, I. G.....Rushford
Day, L. A.....Rochester
Dearing, W. H., Jr.....Rochester
Deeds, C. D.....Rochester
Desjardins, A. U.....Rochester

Dietrich, F. S., Jr.....Rochester
Dixon, C. F.....Rochester
Dolder, F. C.....Eyota
Drake, F. A.....Lanesboro
Drips, D. G.....Rochester
Dry, T. J.....Rochester
Eaton, L. McK.....Rochester
Ecker, A. D.....Rochester
Elkins, E. C.....Rochester
Emmett, J. L.....Rochester
Erich, J. B.....Rochester
Erickson, C. W.....Rochester
Eusterman, G. B.....Rochester
Evarts, A. B.....Rochester
Faber, J. E.....Rochester
Fairchild, R. D.....Rochester
Famiglietti, E. V.....Rochester
Farthing, J. W.....Rochester
Fatherree, T. J., Jr.....Rochester
Fawcett, C. E.....Stewartville
Figi, F. A.....Rochester
Foley, M. P.....Rochester
Foster, F. P.....Rochester
Fricke, R. E.....Rochester
Furey, E. D.....Rochester
Gaarde, F. W.....Rochester
Garrett, L. M.....Rochester
Ghormley, R. K.....Rochester
Gibson, J. K.....Tiltonville, Ohio
Gibson, W. R.....Rochester
Giffin, H. Z.....Rochester
Gillespie, D. L.....Rochester
Gober, O. B.....Rochester
Goldstein, Moe .....Rochester
Good, C. A., Jr.....Rochester
Graham, R. W.....Rochester
Gray, H. K.....Rochester
Griffin, A. M.....Rochester
Groff, J. E.....Rochester
Guernsey, C. M.....Rochester
Gunderson, H. J.....Rochester
Gurney, C. E.....Rochester
Habein, H. C.....Rochester
Haines, D. J., Jr.....Rochester
Haines, S. F.....Rochester
Hall, B. E.....Rochester
Hallenbeck, D. F.....Rochester

Harrington, S. W.....Rochester
Hartman, H. R.....Rochester
Havens, F. Z.....Rochester
Heck, F. J.....Rochester
Heffner, R. R.....Rochester
Heilman, F. R.....Rochester
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove
Helm, Standiford .....Rochester
Helmholz, H. F.....Rochester
Hempstead, B. E.....Rochester
Hench, P. S.....Rochester
Henderson, M. S.....Rochester
Henthorne, J. C.....Rochester
Herrell, W. E.....Rochester
Hertz, C. S.....Rochester
Hewitt, E. S.....Rochester
Hewitt, R. M.....Rochester
Heyerdale, O. C.....Rochester
Heyerdale, W. W.....Rochester
Hines, E. A., Jr.....Rochester
Hinshaw, H. C.....Rochester
Horton, B. T.....Rochester
Howell, L. P.....Rochester
Hubly, J. W.....Rochester
Hunt, A. B.....Rochester
Ingham, D. W.....Rochester
Jackman, R. J.....Rochester
Jensen, R. M.....Rochester
Jewett, R. E.....Rochester
Johnson, H. P.....Harmony
Johnson, R. B.....Lanesboro
Jones, H. M.....Rochester
Joyce, G. T.....Rochester
Kahler, J. E.....Rochester
Kaump, D. H.....Rochester
Kearney, R. W.....Rochester
Keith, N. M.....Rochester
Kelly, H. M.....Rochester
Kendrick, T. D. H.....Rochester
Kennedy, R. L. J.....Rochester
Kepler, E. J.....Rochester
Kermott, L. H., Jr.....Rochester
Kernohan, J. W.....Rochester
Kerr, J. G.....Rochester
Kirklin, B. R.....Rochester
Kirklin, O. L.....Rochester
Knepper, P. A.....Rochester
Koelsche, G. A.....Rochester
Kowallis, G. F.....Rochester
Kraft, H. C.....Rochester
Krusen, F. H.....Rochester
Kvale, W. F.....Rochester
Laird, D. R.....Rochester
Lannin, J. C.....Mabel
Leddy, E. T.....Rochester
Lemon, R. G.....Rochester
Lemon, W. S.....Rochester
Lenton, H. P.....Rochester
Lewis, E. B.....Rochester
Lillie, H. I.....Rochester
Lipscomb, W. R.....Rochester
Lloyd, S. J.....Rochester
Lochead, D. C.....Rochester
Logan, A. H.....Rochester
Lord, G. A.....Rochester
Love, J. G.....Rochester
Lovelady, S. B.....Rochester
Luden, Georgine..Victoria, B. C., Can.
Lundy, J. S.....Rochester
Macey, H. B.....Rochester
MacKenzie, W. C.....Rochester
MacLean, A. R.....Rochester
Magath, T. B.....Rochester
Magiera, E. A.....Rochester
Maksim, George, Jr.....Rochester
Malerich, J. A.....Caledonia
Mann, A. S., Jr.....Rochester
Mann, F. C.....Rochester
Marcley, D. M.....Rochester
Mason, L. K.....Rochester
Masson, D. M.....Rochester
Masson, J. C.....Rochester
Mayo, C. H.....Rochester
Mayo, C. W.....Rochester
Mayo, W. J.....Rochester
Maytum, C. K.....Rochester
McCarty, W. C.....Rochester
McDonald, J. R.....Rochester
McGowan, J. M.....Rochester
McKaig, C. B.....Pine Island
McKean, R. S.....Rochester
Mecray, P. M., Jr.....Rochester
Meyerding, H. W.....Rochester
Miller, J. M.....Rochester
Mills, J. H.....Tacoma, Wash.
Moersch, F. P.....Rochester
Moersch, H. J.....Rochester
Montgomery, Hamilton .....Rochester
Montgomery, T. R.....Rochester
Moore, F. H.....Rochester
Morlock, C. G.....Rochester
Mousel, L. H.....Rochester
Mulrooney, R. E.....Rochester
Mundell, B. J.....Rochester
Mussey, R. D.....Rochester
Nass, H. A. .....Mabel
Neel, H. B.....Rochester
Nesselrod, J. P.....Rochester
New, G. B.....Rochester
Odel, H. M.....Rochester
O'Leary, P. A.....Rochester
Olsen, A. M.....Rochester
Olson, E. A.....Pine Island
Olson, G. E.....West Concord
Onsgard, L. K., Jr.....Houston
Onsgard, L. K., Sr.....Houston
Parker, R. L.....Rochester
Parkhill, E. M.....Rochester
Pemberton, J. deJ.....Rochester
Perozzi, Thelma .....Rochester
Peterson, D. L.....Rochester
Pilcher, Frederick, Jr.....Rochester
Piper, M. C.....Rochester
Plummer, W. A.....Rochester
Pollock, L. W.....Rochester
Pool, T. L.....Rochester
Popp, W. C.....Rochester
Prangen, A. D.....Rochester
Prickman, L. E.....Rochester
Priestley, J. T.....Rochester
Randall, L. M.....Rochester
Regan, J. F.....Rochester
Rhorer, R. J.....Rochester
Rickey, G. L.....Rochester
Risser, A. F.....Stewartville
Rivers, A. B.....Rochester
Robertson, H. E.....Rochester
Rosenberg, E. F.....Rochester
Rozendaal, H. M...Schenectady, N. Y.
Rosenow, E. C.....Rochester
Rosenow, E. C., Jr.....Rochester
Rucker, C. W.....Rochester
Rynearson, E. H.....Rochester
Sanford, A. H.....Rochester
Sanford, H. S.....Rochester
Saunders, T. S., Jr.....Rochester
Sawyer, M. H.....Rochester
Schmidt, H. W.....Rochester
Schulhof, M. G.....Rochester
Searles, P. W.....Rochester
Secord, E. W.....Rochester
Sheldon, W. D.....Rochester
Shoemaker, Rosemary .....Rochester
Sibley, W. L.....Rochester
Simpson, W. C.....Rochester
Simonton, K. M.....Rochester
Skaug, H. M.....Chatfield
Slocumb, C. H.....Rochester
Smith, B. F.....Rochester
Smith, C. H.....Rochester
Smith, F. D.....Kasson
Smith, F. L.....Rochester
Smith, H. L.....Rochester
Smith, L. A.....Rochester
Smith, N. D.....Rochester
Snell, A. M.....Rochester
Snyder, J. M.....Rochester
Sowers, B. F.....Rochester
Sprague, R. G.....Rochester
Stalker, L. K.....Rochester
Steenrod, E. J.....Rochester
Steffens, L. F.....Rochester
Stevenson, C. A.....Rochester
Stuhler, L. G.....Rochester
Sutherland, C. G.....Rochester
Swingle, H. F., Jr.....Rochester
Teem, M. Van B.....Rochester
Tennison, W. J., III.....Rochester
Thompson, G. J.....Rochester
Tierney, C. M.....Harmony
Tillisch, J. H.....Rochester
Tuohy, E. B.....Rochester
Wagener, H. P.....Rochester
Walsh, M. N.....Rochester
Walters, Waltman .....Rochester
Ward, C. E.....Rochester
Washburn, R. N.....Rochester
Watkins, C. H.....Rochester
Waugh, J. M.....Rochester
Weber, H. M.....Rochester
Weir, J. F.....Rochester
Welch, C. S.....Rochester
Wellbrock, W. L. A.....Rochester
Wesson, H. R.....Rochester
Whittaker, L. D.....Rochester
Wilbur, D. L.....Rochester
Wilder, R. M.....Rochester
Williams, D. H.....Rochester
Williams, H. L., Jr.....Rochester
Williams, R. V.....Rushford
Willius, F. A.....Rochester
Wilson, L. B.....Rochester
Wolff, L. H.....Rochester
Wolfram, D. J.....Rochester
Woltman, H. W.....Rochester
Wood, G. H.....Rochester
Wood, H. G.....Rochester
Woodruff, C. W.....Chatfield
Wrork, D. H.....Rochester
Yeager, C. L.....Rochester
Young, H. H.....Rochester
Zide, H. A.....Rochester

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail and Wilkin Counties
Regular meetings, Second Wednesday every even month
Annual meeting, December
Number of Members: 54

President
Vail, J. B.....Henning

Secretary
Baker, N. H.....Fergus Falls

Arndt, H. W.....Frazee
Baker, A. C.....Fergus Falls
Baker, N. H.....Fergus Falls
Bergquist, K. E.....Battle Lake
Blakey, A. R.....Osakis
Boline, C. A.....Battle Lake
Boyd, L. M.....Alexandria
Boysen, Peter .....Pelican Rapids
Broker, W. S.....Battle Lake
Burnap, W. L.....Fergus Falls
Clifford, G. W.....Osakis
Combacker, L. C.....Fergus Falls
Drought, W. W.....Fergus Falls
Esser, John .....Perham
Estrem, C. O.....Fergus Falls
Gardner, W. P.....Fergus Falls
Hand, W. R.....Elbow Lake
Hanson, E. C.....New York Mills
Haskell, A. D.....Alexandria
Heiberg, E. A.....Fergus Falls
Hodgson, C. H.....Rochester
Jacobs, G. C.....Fergus Falls
Johnson, O. V.....Fergus Falls
Katzberg, L. W.....Fergus Falls
Kierland, P. E.....Alexandria
Lee, W. A.....Fergus Falls
Leibold, H. H.....Parkers Prairie
Leland, J. T.....Herman
Lewis, A. J.....Henning
Love, F. A.....Carlos
Lund, C. J. T.....Underwood
Meckstroth, C. W.....Brandon
Miller, W. A.....New York Mills
Mouritsen, G. J.....Fergus Falls
Naegeli, Frank .....Fergus Falls
Nelson, W. I.....Minneapolis
Otto, H. C.....Frazee
Parson, E. L. B.....Elbow Lake
Parson, L. R.....Elbow Lake
Patterson, W. L.....Fergus Falls
Paulson, T. S.....Fergus Falls
Powers, F. W.....Barrett
Randall, A. M., ...Ashby
Reeve, E. T.....Elbow Lake
Rimer, E. W.....Breckenridge
Satersmoen, Theodore...Pelican Rapids
Sather, E. R.....Alexandria
Serkland, J. C.....Rothsay
Steube, R. W.....Alexandria
Sutton, H. R.....Hoffman
Tanquist, E. J.....Alexandria
Vail, J. B.....Henning
Windsor, R. L.....Fergus Falls
Wray, W. E.....Campbell

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday in every month excepting June, July, August
Annual meeting, last Monday in January
Number of Members: 324

President
Hagaman, G. K. ..... St. Paul

Secretary
Hultkrans, J. C. ..... St. Paul

Abbott, J. S. ..... St. Paul
Ahrens, A. E. ..... St. Paul
Ahrens, A. H. ..... St. Paul
Alberts, M. W. ..... St. Paul
Alden, J. F. ..... St. Paul
Alexander, F. H. ..... St. Paul
Armstrong, J. M. ..... St. Paul
Arnquist, A. S. ..... St. Paul
Aurelius, J. R. ..... St. Paul
Ausman, C. F. ..... St. Paul
Backus, A. S. ..... St. Paul
Bacon, D. K. ..... St. Paul
Bacon, L. C. ..... St. Paul
Barry, L. W. ..... St. Paul
Barsness, Nellie ..... St. Paul
Beadle, W. D. ..... Cannon Falls
Beals, Hugh ..... St. Paul
Beek, H. O. ..... St. Paul
Bell, C. C. ..... St. Paul
Benepe, J. L. ..... St. Paul
Bennion, P. H. ..... St. Paul
Bentley, N. P. ..... St. Paul
Berrisford, P. D. ..... St. Paul
Bicek, J. F. ..... St. Paul
Binger, H. E. ..... St. Paul
Birnberg, T. L. ..... St. Paul
Bock, R. A. ..... St. Paul
Boeckmann, Egil ..... St. Paul
Bohland, E. H. ..... St. Paul
Bolender, H. L. ..... St. Paul
Borg, J. F. ..... St. Paul
Bouma, L. R. ..... St. Paul
Brand, G. D. ..... St. Paul
Bray, E. R. ..... St. Paul
Briggs, J. F. ..... St. Paul
Brodie, W. D. ..... St. Paul
Brown, E. I. ..... St. Paul
Brown, J. C. ..... St. Paul
Bulinski, T. J. ..... St. Paul
Burch, F. E. ..... St. Paul
Burns, R. M. ..... St. Paul
Burton, C. G. ..... St. Paul
Busher, H. H. ..... St. Paul
Caldwell, J. P. ..... St. Paul
Carroll, W. C. ..... St. Paul
Chatterton, C. C. ..... St. Paul
Christiansen, A. ..... St. Paul
Christison, J. T. ..... St. Paul
Clark, H. B., Jr. ..... St. Paul
Clark, T. C. ..... Minneapolis
Colby, Woodard ..... St. Paul
Cole, W. H. ..... St. Paul
Collie, H. G. ..... St. Paul
Colvin, A. R. ..... St. Paul
Connor, C. E. ..... St. Paul
Cook, C. K. ..... St. Paul
Countryman, R. S. ..... St. Paul
Cowern, E. W. ..... North St. Paul
Critchfield, L. R. ..... St. Paul
Culligan, J. M. ..... St. Paul

Dack, L. G. ..... St. Paul
Daugherty, E. B. ..... St. Paul
Daugherty, L. E. ..... St. Paul
Davis, Herbert ..... St. Paul
Davis, William ..... St. Paul
Dedolph, Karl ..... St. Paul
Delavan, P. A. ..... St. Paul
Derauf, B. I. ..... St. Paul
Dickson, T. H., Jr. ..... St. Paul
Dittman, G. C. ..... St. Paul
Donohue, P. F. ..... St. Paul
Dovre, C. M. ..... St. Paul
Drake, C. B. ..... St. Paul
Dunn, J. N. ..... St. Paul

Earl, G. A. ..... St. Paul
Earl, Robert ..... St. Paul
Edlund, G. ..... St. Paul
Edwards, J. W. ..... St. Paul
Edwards, T. J. ..... St. Paul
Ely, O. S. ..... South St. Paul
Emerson, E. C. ..... St. Paul
Endress, E. K. ..... St. Paul
Engberg, E. J. ..... St. Paul
Ernest, G. C. ..... South St. Paul
Eshelby, E. C. ..... St. Paul
Fahey, E. W. ..... St. Paul
Ferguson, J. C. ..... St. Paul
Fesler, H. H. ..... St. Paul
Flanagan, H. F. ..... St. Paul
Fogarty, C. W. ..... St. Paul
Fogelberg, E. J. ..... St. Paul
Foley, F. E. B. ..... St. Paul
Freeman, C. D. ..... St. Paul
Gager, E. C. ..... St. Paul
Garbrecht, Arthur ..... St. Paul
Gardiner, D. G. ..... St. Paul
Geer, E. K. ..... St. Paul
Gehlen, J. N. ..... St. Paul
Geist, G. A. ..... St. Paul
Ghent, C. H. ..... St. Paul
Gibbs, E. C. ..... St. Paul
Gilfillan, J. S. ..... St. Paul
Ginsberg, Wm. ..... St. Paul
Goltz, E. V. ..... St. Paul
Grant, H. W. ..... St. Paul
Gratzek, Thomas ..... St. Paul
Gruenhagen, A. P. ..... St. Paul
Hagaman, G. K. ..... St. Paul
Hall, A. R. ..... St. Paul
Hall, H. H. ..... St. Paul
Hammes, E. M. ..... St. Paul
Hammond, J. F. ..... St. Paul
Harmon, G. E. ..... St. Paul
Hartfiel, W. F. ..... St. Paul
Hartley, E. C. ..... St. Paul
Hassett, M. F. ..... St. Paul
Hauser, V. P. ..... St. Paul
Hawkins, V. J. ..... St. Paul
Heath, A. C. ..... Stillwater
Heck, W. W. ..... St. Paul
Hedenstrom, F. G. ..... St. Paul
Hengstler, W. H. ..... St. Paul
Hensel, C. N. ..... St. Paul
Heron, R. C. ..... St. Paul
Herrmann, E. T. ..... St. Paul
Hesselgrave, S. S. ..... St. Paul
Hilger, A. W. ..... St. Paul
Hilger, D. D. ..... St. Paul
Hilger, L. A. ..... St. Paul
Hilleboe, H. E. ..... St. Paul
Hiniker, L. P. ..... St. Paul
Hochfilzer, J. J. ..... St. Paul
Hoff, Alfred ..... St. Paul
Hoffman, M. H. ..... St. Paul
Holcomb, J. T. ..... St. Paul
Holcomb, O. W. ..... St. Paul
Holt, J. E. ..... St. Paul
Hopkins, G. W. ..... St. Paul
Howard, M. A. ..... St. Paul
Howard, W. S. ..... St. Paul
Hullsick, R. B. ..... St. Paul
Hultkrans, J. C. ..... St. Paul
Ide, A. W. ..... St. Paul
Ikeda, Kano ..... St. Paul
Ingerson, C. A. ..... St. Paul

Jesion, J. W. ..... St. Paul
Johanson, W. G. ..... St. Paul
Johnson, A. M. ..... St. Paul
Johnson, J. A. ..... St. Paul
Johnson, R. G. ..... St. Paul
Johnson, T. H. ..... San Francisco, Calif.
Jones, D. C. ..... St. Paul
Jones, E. M. ..... St. Paul
Kamman, G. R. ..... St. Paul
Kannary, E. L. ..... St. Paul
Kaplan, D. H. ..... St. Paul
Kasper, E. M. ..... St. Paul
Keefe, Rolland ..... St. Paul
Kelly, J. V. ..... St. Paul
Kelly, P. H. ..... St. Paul
Kenefick, E. V. ..... St. Paul
Kennedy, W. A. ..... St. Paul
Kesting, Herman ..... St. Paul
King, G. L. ..... St. Paul
King, Z. P. ..... St. Paul
Klein, H. N. ..... St. Paul
Knauff, M. K. ..... St. Paul
Kugler, A. A. ..... St. Paul
Kvitrud, Gilbert ..... St. Paul

Langenderfer, F. V. ..... St. Paul
Larsen, C. L. ..... St. Paul
Lax, M. H. ..... St. Paul
Leahy, Bartholmew ..... St. Paul
Leavenworth, R. O. ..... St. Paul
Leitch, Archibald ..... St. Paul
Leonard, G. J. ..... Hastings
Lepak, J. A. ..... St. Paul
Lerche, William ..... Cable, Wis.
Leven, N. L. ..... St. Paul
Levin, Bert ..... St. Paul
Lick, C. L. ..... St. Paul
Lippman, H. S. ..... St. Paul
Little, W. J. ..... St. Paul
Livingstone, J. W. ..... Hudson, Wis.
Lowe, E. R. ..... South St. Paul
Lowe, T. A. ..... South St. Paul
Lundholm, A. M. ..... St. Paul
Lynch, F. W. ..... St. Paul
Madden, J. F. ..... St. Paul
Markoe, J. C. ..... St. Paul
Martineau, J. L. ..... St. Paul
Mattson, C. H. ..... St. Paul
McCarthy, J. J. ..... St. Paul
McCarthy, W. R. ..... St. Paul
McClanahan, J. H. ..... White Bear
McClanahan, T. S. ..... White Bear
McLaren, J. M. ..... St. Paul
McNevin, C. F. ..... St. Paul
Meade, J. R. ..... St. Paul
Mears, B. J. ..... St. Paul
Medelman, J. P. ..... St. Paul
Meyerding, E. A. ..... St. Paul
Moga, J. A. ..... St. Paul
Mogilner, S. N. ..... St. Paul
Molander, H. A. ..... St. Paul
Moquin, M. A. ..... St. Paul
Moran, T. R. ..... St. Paul
Moriarty, Berenice ..... St. Paul
Morrissey, F. B. ..... St. Paul
Mortenson, N. G. ..... St. Paul
Moynihan, T. J. ..... St. Paul
Muller, R. T. ..... St. Paul
Myers, Thomas ..... St. Paul
Naegeli, A. E. ..... St. Paul
Naslund, A. W. ..... St. Paul
Neher, F. H. ..... St. Paul
Nelson, L. A. ..... St. Paul
Nichols, A. E. ..... St. Paul
Noble, J. F. ..... St. Paul
Nye, K. A. ..... St. Paul
Nye, L. L. ..... St. Paul
O'Connor, L. J. ..... St. Paul
Oerting, Harry ..... St. Paul
Ogden, Warner ..... St. Paul
Ohage, Justus, Jr. ..... St. Paul
Olson, C. A. ..... St. Paul
O'Reilley, B. E. ..... St. Paul
Ostergren, E. W. ..... St. Paul
Ouelette, A. J. ..... St. Paul
Page, C. V. ..... St. Paul
Pearson, F. R. ..... St. Paul
Pedersen, A. H. ..... St. Paul
Perry, C. G. ..... St. Paul
Peterson, D. B. ..... St. Paul
Peterson, J. L. E. ..... St. Paul
Peterson, V. N. ..... St. Paul
Plondke, F. J. ..... St. Paul
Prendergast, H. J. ..... St. Paul
Prendergast, J. J. ..... St. Paul
Prins, L. R. ..... Albert Lea

Radabaugh, R. C. ..... Hastings
Ramsey, W. R. ..... St. Paul
Richards, E. T. F. ..... St. Paul
Richardson, H. E. ..... St. Paul
Ritchie, H. P. ..... St. Paul
Ritt, A. E. ..... St. Paul
Rogers, J. T. ..... St. Paul
Rogers, S. F. ..... St. Paul
Rosenholtz, Burton ..... St. Paul
Rosenthal, Robert ..... St. Paul
Rothrock, J. L. ..... St. Paul
Rothschild, H. J. ..... St. Paul
Roy, Philemon ..... St. Paul
Ruhberg, G. N. ..... St. Paul
Rutherford, W. C. ..... St. Paul
Ryan, J. J. ..... St. Paul
Ryan, J. M. ..... St. Paul
Ryan, M. E. ..... St. Paul

Sarnecki, M. M. ..... St. Paul
Satterlund, V. L. ..... St. Paul
Savage, F. J. ..... St. Paul
Schoch, R. B. J. ..... St. Paul
Schons, Edward ..... St. Paul
Schuldt, F. C. ..... St. Paul
Schulze, A. G. ..... St. Paul
Schwyzer, Arnold ..... St. Paul
Scott, E. E. ..... St. Paul
Senkler, G. E. ..... St. Paul
Setzer, H. J. ..... St. Paul
Shellman, J. L. ..... St. Paul
Shillington, M. A. ..... St. Paul
Shimonek, S. W. ..... St. Paul
Short, Jacob ..... St. Paul
Simons, L. T. ..... St. Paul
Singer, B. J. ..... St. Paul
Skinner, H. O. ..... St. Paul
Smisek, E. A. ..... St. Paul
Snyder, G. W. ..... St. Paul
Sohlberg, O. I. ..... St. Paul

Souster, B. B.....St. Paul
Sprafka, J. M.....St. Paul
Steinberg, C. L.....St. Paul
Sterner, E. G.....St. Paul
Stewart, Alexander .....St. Paul
Stinnette, S. E.....St. Paul
Stoeckmann, A. E.....St. Paul
Stolpestad, A. H.....St. Paul
Stolpestad, H. L.....St. Paul
Strate, G. E.....St. Paul
Swanson, J. A.....St. Paul
Swendson, J. J.....St. Paul
Teisberg, C. B.....St. Paul
Thompson, F. A.....St. Paul
Thoreson, M. O.....St. Paul
Tifft, C. R.....St. Paul
Tregilgas, H. R.....South St. Paul
Van Slyke, C. A.....St. Paul
Veirs, Dean .....St. Paul
Veirs, R. S.....St. Paul
Venables, A. E.....St. Paul
Von der Weyer, William.....St. Paul
Waas, C. W.....St. Paul
Walker, A. E.....St. Paul
Walter, C. W.....St. Paul
Warnock, R. W.....St. Paul
Warren, C. A.....St. Paul
Warren, E. L.....St. Paul
Watz, C. E.....St. Paul
Welch, M. C.....St. Paul
Werner, O. S.....Cambridge
Wheeler, M. W.....St. Paul
Whitacre, J. C.....St. Paul
Whitmore, Frank .....St. Paul
Williams, C. K.....St. Paul
Williamson, G. A.....St. Paul
Wilson, J. A.....St. Paul
Wilson, J. V.....St. Paul
Winnick, J .B.....St. Paul
Wold, K. C.....St. Paul
Wolfe, H. H.....St. Paul
Wolff, H. J.....St. Paul
Youngren, E. R.....St. Paul
Zander, C. H.....St. Paul
Zimmermann, H. B.....St. Paul

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake and Roseau Counties
Regular meetings, quarterly
Annual meeting, second Tuesday, December
Number of Members: 56

President
Delmore, J. L.....Roseau

Secretary
Oppegaard, C. L.....Crookston

Adkins, C. M.....Thief River Falls
Adkins, G. H.....Grygla
Anderson, W. S.....Minneapolis
Berge, D. O.....Roseau
Bertelson, O. L.....Crookston
Biedermann, Jacob..Thief River Falls
Blegen, H. M.....Warren
Boardman, D. V.....Twin Valley
Bohl, G. W.....Ada
Borreson, Baldwin..Thief River Falls
Bratrud, O. E.....Thief River Falls
Brink, A. A.....Baudette
Brown, L. L.....Crookston
Culver, L. G.....Thief River Falls
Delmore, J. L.....Roseau
Ederer, J. J.....Mahnomen
Edstrom, Henry.....Dubuque, Iowa
Erickson, Eskil.....Halstad
Froats, C. W.....Thief River Falls
Griffin, P. J.....Fertile
Haugseth, Enoch.....Twin Valley
Henney, W. H.....McIntosh
Hollands, W. H.....Fisher
Holmstrom, C. H.....Warren
Kahala, Arthur.....Crookston
Kirk, G. P.....East Grand Forks
Knutson, G. A.....Greenbush
Leitch, N. M.....Warroad
*Locken, O. E.....Crookston
Lynde, O. G.....Thief River Falls
Mellby, O. F.....Thief River Falls
Mercil, W. F.....Crookston
Morley, G. A.....Crookston
Nelson, H. E.....Crookston
Norman, J. F.....Crookston
Ohnstad, J. L.....McIntosh
Oppegaard, C. L.....Crookston
Oppegaard, M. O.....Crookston
Paradis, W. G.....Crookston
Parsons, J. G.....Crookston
Reff, A. R.....Crookston
Rice, H. R.....Roseau
Roy, J. A.....Red Lake Falls
Shaleen, A. W.....Hallock
Shedlov, Abraham.....Fosston
Sherman, R. V.....Thief River Falls
Smith, A. M.....Thief River Falls
Sorenson, E. M.....Tyler
Stevens, John.....Gonvick
Stocking, F. F.....Hallock
Stuurmanns, S. H.....Erskine
Swedenburg, A. W...Thief River Falls
Swedenburg, P. A...Pawnee, Nebraska
Tanglin, W. G. L.....Mahnomen
Torgerson, W. B.....Oklee
Wiltrout, I. G.....Oslo

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Regular meetings, May, August, November, and February
Annual meeting, May
Number of Members: 25

President
Saffert, C. A.....New Ulm

Secretary
Fritsche, C. J.....New Ulm

Brey, F. W.....Wabasso
Dubbe, F. H.....New Ulm
Dysterheft, A. F.....Gaylord
Fritsche, Albert.....New Ulm
Fritsche, C. J.....New Ulm
Fritsche, T. R.....New Ulm
Gibbons, F. C.....Comfrey
Goblirsch, A. P.....Sleepy Eye
Hammermeister, T. F.....New Ulm
Hovde, Rolf.....Winthrop
Jamieson, Earl.....Walnut Grove
Just, H. J.....Lafayette
Kolset, C. D.....Sanborn
Kusske, A. L.....New Ulm
Mortensbak, H. E.....Hanska
Nuessle, W. G.....Springfield
Olson, K. L.....Gibbon
Peterson, R. A.....Vesta
Reineke, G. F.....New Ulm
Saffert, C. A.....New Ulm
Seifert, O. J.....New Ulm
Vogel, H. A. L.....New Ulm
Vogel, J. H.....New Ulm
Weiser, G. B.....New Ulm
Wohlrabe, E. J.....Springfield

RENVILLE COUNTY MEDICAL SOCIETY

Regular meeting, first Tuesday of each month
Annual meeting, first Tuesday of November
Number of Members: 20

President
Adams, R. C.....Bird Island

Secretary
Madland, R. S.....Fairfax

Adams, R. C.....Bird Island
Billings, R. E.....Franklin
Brand. W. A.....Redwood Falls
Cole, H. B.....Redwood Falls
Cole, J. G.....Redwood Falls
Cosgriff, J. A.....Bird Island
Dordal, J.....Sacred Heart
Fawcett, A. M.....Renville
Flinn, T. E.....Redwood Falls
Gaines, E. C.....Buffalo Lake
Hartmann, C. M.....Fairfax
Johnson, O. H.....Redwood Falls
Johnson, W. E.....Morgan
Lenz, J. R.....Morton
Loenholdt, E. H.....Hector
Madland, R. S.....Fairfax
Mesker, G. H.....Olivia
Passer, A. A.....Olivia
Penhall, F. W.....Morton
Solsem, F. N.....Sacred Heart

RICE COUNTY MEDICAL SOCIETY

Regular meetings, seven annually
Annual meeting, December
Number of members: 39

President
Huxley, F. R.....Faribault

Secretary
Plonske, C. J.....Faribault

Babcock, F. M.....Northfield
Beede, E. R.....Faribault
Davis, F. U.....Faribault
Dugan, L. F.....Faribault
Dungay, N. S.....Northfield
Francis, D. W.....Morristown
Haessly, S. B.....Faribault
Hanson, A. M.....Faribault
Haynes, A. L.....Faribault
Huxley, F. R.....Faribault
Kanne, C. W.....Faribault
Kucera, S. T.....Lonsdale
Lende, Norman.....Faribault
Lexa, F. J.....Lonsdale
Lufkin, C. D.....Northfield
Lyght, C. E.....Northfield
Mayland, M. L.....Faribault
McKeon, J. O.....Montgomery
Meyer, F. C.....Kenyon
Meyer, P. F.....Faribault
Moses, Joseph, Jr.....Northfield
Moses, R. R.....Kenyon
Murdoch, J. M.....Faribault
Nuetzman, A. W.....Faribault
Plonske, C. J.....Faribault
Robilliard, C. M.....Faribault
Rohrer, C. A.....Waterville
Rudie, C. N.....Kenyon
Rumpf, C. W.....Fairbault
Rumpf, W. H.....Faribault
Seeley, I. F.....Northfield
Stewart, Gwendolyn.....Fairbault
Thorson, O. P.....Northfield
Traeger, C. A.....Faribault
Warren, F. S.....Washington, D.C.
Wilkowske, R. J.....Nerstrand
Wilson, Warren.....Northfield
Wilson, W. E.....Northfield
Wylie, A. R. T.....Fairbault

*Deceased.

ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Itasca, Lake and St. Louis Counties
Regular meetings, second Thursday every month
Annual meeting, December
Number of Members: 191

President
Manley, J. R.....Duluth

Secretary
MacRae, G. C.....Duluth

Adams, B. S.....Hibbing
Addy, E. R.....Gilbert
Akins, W. M.....Eveleth
Armstrong, E. L.....Duluth
Athens, A. G.....Duluth
Ayres, G. T.....Ely
Bagley, E. C.....Duluth
Bagley, W. R.....Duluth
Bardon, Richard.....Duluth
Barney, L. A.....Duluth
Berdez, G. L.....Duluth
Bianco, A. J.....Duluth
Binet, H. E.....Grand Rapids
Blacklock, S. S.....Hibbing
Blakely, C. C.....Barnum
Boman, P. G.....Duluth
Bowen, R. L.....Hibbing
Boyer, S. H., Jr.....Duluth
Boyer, S. H., Sr.....Duluth
Braverman, N. J.....Duluth
Bray, C. W.....Biwabik
Bray, P. N.....Duluth
Buckley, R. P.....Duluth
Burns, R. L.....Two Harbors
Cantwell, W. F...International Falls
Carstens, C. F.....Hibbing
Chapman, T. L.....Duluth
Cheney, E. L.....Duluth
Chessen, James.....Duluth
Christensen, E. P.....Two Harbors
Clark, F. F.....Duluth
Clement, T. G.....Duluth
Collins, A. N.....Duluth
Collins, H. C.....Duluth
Coventry, W. A.....Duluth
Coventry, W. D.....Duluth
Davis, B. F.....Duluth
Doolittle, L. E.....Duluth
Doyle, G. C.....Duluth
Drenning, F. C.....Duluth
Eckman, P. F.....Duluth
Eckman, R. J.....Duluth
Ekblad, J. W.....Duluth
Eklund, W. J.....Duluth
Elias, F. J.....Duluth
Emanuel, K. W.....Duluth
Engdahl, F. W.....Grand Rapids
Eppard, R. M.....Cloquet
Estrem, T. A.....Hibbing
Ewens, H. B.....Virginia
Fankboner, A. V.....Buhl
Fawcett, K. R.....Duluth
Fellows, M. F.....Duluth
Feuling, J. C.....Bovey
Fiala, M. J.....Duluth
Fischer, M. McC.....Duluth
Forbes, R. S.....Duluth
Gendron, J. F.....Grand Rapids
Gillespie, M. G.....Duluth
Gillespie, N. H.....Duluth
Giroux, A. A.....Duluth
Goldish, D. R.....Duluth
Goodman, C. E.....Virginia
Gowan, L. R.....Duluth
Graham, Robert.....Duluth
Graves, W. N.....Duluth
Hall, A. E.....Virginia
Haney, C. L.....Duluth
Harris, C. N.....Hibbing
Hatch, W. E.....Duluth
Hathaway, S. J.....Proctor
Hayes, M. F.....Nashwauk
Hedberg, G. A.....Nopeming
Heiam, W. C.....Cook
Heimark, O. E.....Duluth
Hilding, A. C.....Duluth
Hill, F. E.....Duluth
Hirschboeck, F. J.....Duluth
Hoff, H. O.....Duluth
Hursh, M. M.....Cohasset
Jacobson, Clarence.....Chisholm
Jensen, T. J.....Duluth
Jolin, F. M.....Grand Rapids
Jolin, R. V.....Grand Rapids
Karleen, P. E...Boulder Creek, Calif.
Keyes, C. R.....Duluth
Kiesling, I. H.....Nashwauk
Klein, A. D., Jr.....Chisholm
Klein, Harry.....Duluth
Knapp, F. N.....Duluth
Kohlbry, C. O.....Duluth
Kotchevar, F. R.....Eveleth
Kraft, Peter.....Duluth
Krantz, C. I.....Duluth
Kuth, J. R.....Duluth
Laird, A. T.....Nopeming
Lenont, C. B.....Virginia
Lepak, F. J.....Duluth
Litman, S. N.....Duluth
Loofbourrow, E. H.....Keewatin
Lundquist, C. W.....Hibbing
Macfarlane, P. H.....Chisholm
MacRae, G. C.....Duluth
Magney, F. H.....Duluth
Malmstrom, J. A.....Virginia
Manley, J. R.....Duluth
Martin, E. T.....Duluth
Martin, W. C.....Duluth
Mayne, R. M.....Duluth
McCarty, P. D.....Ely
McComb, C. F.....Duluth
McCoy, M. K.....Duluth
McDaniel, S. P.....Virginia
McDonald, A. L.....Duluth
McHaffie, O. L.....Duluth
McLeod, J. L.....Grand Rapids
McNutt, J. R.....Duluth
Mead, C. H.....Duluth
Merriman, L. L.....Duluth
Moe, R. J.....Duluth
Moe, Thomas.....Moose Lake
Monroe, P. B.....Two Harbors
More, C. W.....Eveleth
Morsman, L. W.....Hibbing
Morss, C. R.....Zumbrota
Mueller, S. C.....Duluth
Nelson, E. H.....Chisholm
Nelson, R. L.....Duluth
Nicholson, M. A.....Duluth
Nutting, R. E.....Duluth
Olson, A. E.....Duluth
Parker, O. W.....Ely
Pearsall, R. P.....Virginia
Pennie, D. F.....Duluth
Peterson, E. N.....Virginia
Peterson, J. H.....Duluth
Plowman, E. T.....Calumet
Power, J. E.....Duluth
Puumala, R. H.....Cloquet
Raadquist, C. S.....Hibbing
Raiter, F. W. S.....Cloquet
Raiter, R. F.....Cloquet
Robinson, J. M.....Duluth
Rowe, O. W.....Duluth
Rowles, E. K.....Coleraine
Rudie, P. S.....Duluth
Ryan, W. J.....Duluth
Sach-Rowitz, Alvin.....Moose Lake
Salter, R. A.....Virginia
Sarff, O. E.....Virginia
Sax, S. G.....Duluth
Scherer, C. A.....Duluth
Schroder, C. H.....Duluth
Seashore, R. T.....Duluth
Shapiro, E. Z.....Duluth
Shastid, T. H.....Duluth
Shaw, A. W.....Buhl
Sinamark, Andrew.....Hibbing
Sisler, C. E.....Grand Rapids
Slyfield, F. F.....Duluth
Smith, C. M.....Duluth
Smith, W. R.....Grand Marais
Spicer, F. W.....Duluth
Spurbeck, R. G.....Cloquet
Strathern, M. L.....Gilbert
Strobel, W. G.....Duluth
Stuart, A. B.....Cloquet
Sukeforth, L. A.....Duluth
Sutherland, H. N.....Ely
Swanson, P. E.....Virginia
Swenson, A. O.....Duluth
Taylor, C. W.....Duluth
Tibbetts, M. H.....Duluth
Tilderquist, D. L.....Duluth
Tuohy, E. L.....Duluth
Urberg, S. E.....Duluth
Vercellini, C. E.....Duluth
Walker, A. E.....Duluth
Wallace, M. O.....Duluth
Watson, C. G.....Soudan
Webber, E. E.....Duluth
Wells, A. H.....Duluth
West, E. J.....Duluth
Wheeler, D. W.....Duluth
Wilkinson, S. L.....Duluth
Wilmot, C. A.....Grand Rapids
Wingquist, C. G.....Carlton
Winter, J. A.....Duluth
Young, T. O.....Duluth
Young, V. A.....Duluth
Zlatovski, M. L.....Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of the month
Annual meeting, June
Number of Members: 33

President
Olson, C. J.....Belle Plaine

Secretary
Crow, E. R.....Arlington

Buck, F. H.....Shakopee
Byram, J. W.....Young America
Cervenka, C. F.....New Prague
Clement, W. B.....Shakopee
Crow, E. R.....Arlington
Eklund, E. J.....Norwood
Emmerson, W. S.....Mayer
Fischer, H. P.....Shakopee
Havel, H. W.....Jordan
Hebeisen, M. B.....Chaska
Henriksen, H. G.....Elko
Juergens, H. M.....Belle Plaine
Klein, J. C.....Shakopee
Kortsch, F. P.....Prior Lake
Lightbourn, E. T.....Jordan
Maertz, W. F.....New Prague
Martin, T. P.....Arlington
Nagel, H. D.....Waconia
Novak, E. E.....New Prague
Olson, C. J.....Belle Plaine
Ormond, D. T.....Waconia
Pearson, B. F.....Shakopee
Phillips, W. H.....Jordan
Pogue, R. E.....Glendale, Calif.
Reiter, H. W.....Shakopee
Riley, J. B.....Fergus Falls
Schimelpfenig, G. T.....Chaska
Shrader, J. S.....Jordan
Simons, B. H.....Chaska
Westerman, A. E.....Montgomery
Westerman, F. C.....Montgomery
Woodworth, L. F.....Le Center
Wunder, H. E.....Shakopee

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone and Rock Counties
Regular meetings, November and April or May
Annual meeting, November
Number of Members: 68

President
Kilbride, E. A.....Worthington

Secretary
DeBoer, Hermanus.....Edgerton

Arnold, E. W.....Adrian
Basinger, H. P.....Windom
Basinger, H. R.....Mountain Lake
Beckering, Gerrit.....Edgerton
Benjamin, W. G.....Pipestone
Bofenkamp, F. W.....Luverne
Bong, J. H.....Jasper
Brown, A. H.....Pipestone
Carlson, J. V.....Westbrook
Chadbourn, A. G.....Heron Lake
Chunn, S. S.....Pipestone
Clark, H. H.....Edgerton
Cress, P. J.....Ellsworth
DeBoer, Hermanus.....Edgerton
Dolan, C. P.....Worthington
Doman, V. W.....Lakefield
Doms, H. C.....Slayton
Dudley, J. H.....Windom
Engh, Sigfred.....Jackson
Halloran, W. H.....Jackson
Halpern, D. J.....Brewster
Harrison, P. W.....Worthington
Hebbel, Robert.....Windom
Hitchings, W. S.....Lakefield
Johnson, R. E.....Worthington
Kelling, L. F.....Lakefield
Kendahl, A. M.....Jasper
Kilbride, E. A.....Worthington
Kilbride, J. S.....Worthington
Larson, J. T.....Lake Wilson
Lindahl, M. J.....Jasper
Lohmann, J. G.....Jasper
Lowe, Thomas.....Pipestone
Maitland, D. P.....Jackson
Maitland, E. T.....Jackson
Manson, F. M.....Worthington
McCrea, J. M.....Fulda
McElmeel, E. F.....Pipestone
McLane, E. G.....Jackson
McLane, W. O.....Jackson
Mork, B. O.....Worthington
Mork, B. O., Jr.....Worthington
Nealy, D. E.....Adrian
Pankratz, P. J.....Mountain Lake
Pasek, A. W.....Lismore
Patterson, W. E.....Westbrook
Piper, W. A.....Mountain Lake
Portmann, W. C.....Jackson
Priest, R. E.....Worthington
Richmond, C. D.....Jeffers
Rose, J. T.....Lakefield
Ross, W. P.....Worthington
Schade, F. L.....Worthington
Schutz, E. S.....Mountain Lake
Sherman, C. L.....Luverne
Sjostrom, L. E.....Storden
Slater, S. A.....Worthington
Sogge, L. L.....Windom
Stanley, C. R.....Worthington
Stevenson, B. M.....Fulda
Stratte, H. C.....Windom
Thorson, E. O.....Luverne
Tofte, Josephine.....Minneapolis
Waller, J. D.....Wilmont
Williams, A. B.....St. Paul
Williams, C. A.....Pipestone
William, L. A.....Slayton
Wright, C. O.....Luverne

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, third Thursday of the month
Annual meeting, third Thursday of December
Number of Members: 56

President
Jones, R. N.....St. Cloud

Secretary
Libert, J. N.....St. Cloud

Adams, L. P.....St. Cloud
Barringer, P. E.....St. Cloud
Beuning, J. B.....Albany
Brigham, C. F.....St. Cloud
Buscher, J. C.....St. Cloud
Clark, H. B.....St. Cloud
Donaldson, C. S.....Foley
DuBois, J. A.....Sauk Center
DuBois, J. F.....Sauk Center
Engstrom, G. F.....Belgrade
Evans, L. M.....Sauk Rapids
Fleming, T. N.....St. Cloud
Freeman, W. L.....St. Cloud
Friesleben, William.....Sauk Rapids
Gaida, J. B.....St. Cloud
Gelz, J. J.....St. Cloud
Goehrs, H. W.....St. Cloud
Haberman, Emil.....Osakis
Halenbeck, P. L.....St. Cloud
Hemstead, Werner.....St. Cloud
Henry, C. J.....Milaca
Holdridge, George.....Foley
Johnson, Walfred.....Sauk Center
Jones, R. N.....St. Cloud
Kern, M. J.....St. Cloud
Kettlewell, R. B.....Sauk Center
Kingsbury, E. M.....Clearwater
Kohler, D. W.....St. Joseph
Koop, S. H.....Richmond
Kuhlmann, August.....Melrose
Lewis, C. B.....St. Cloud
Libert, J. N.....St. Cloud
McDowell, J. P.....St. Colud
Mahowald, A.....Albany
Meyer, A. A.....Melrose
Morgan, H. P.....St. Cloud
Moynihan, A. F.....Sauk Center
Myre, C. R.....Paynesville
Proeschel, R. K.....Kimball
Rathbun, C. A.....St. Cloud
Richards, W. B.....St. Cloud
Ridgway, Alexander.....South Haven
Rumpf, W. H.....St. Cloud
Rydburg, W. C.....Brooten
Schatz, F. J.....St. Cloud
Sher, D. A.....Cold Spring
Sherwood, G. E.....Kimball
Stangl, Fred.....St. Cloud
Stangl, P. E.....St. Cloud
Stewart, N. E.....St. Cloud
Sutton, C. S.....St. Cloud
Walfred, K. A.....St. Cloud
Watson, W. J.....Holdingford
Wenner, W. T.....St. Cloud
Wiechman, F. H.....St. Cloud
Zachman, A. H.....Melrose

STEELE COUNTY MEDICAL SOCIETY

Regular meetings, second Monday of month
Annual meeting, January
Number of Members: 17

President
Schaefer, J. F.....Owatonna

Secretary
McEnaney, C. T.....Owatonna

Berghs, L. V.....Owatonna
Carlson, V. W.....Blooming Prairie
Dewey, D. H.....Owatonna
Ertel, E. Q.....Ellendale
Farabaugh, C. L.....Owatonna
Flores, O. T.....Dodge Center
Kreuzer, T. C.....Owatonna
McEnaney, C. T.....Owatonna
McIntyre, J. A.....Owatonna
Melby, Benedik.....Blooming Prairie
Morehead, D. E.....Owatonna
Nelson, E. J.....Owatonna
Roberts, O. W.....Owatonna
Schaefer, J. F.....Owatonna
Senn, E. W.....Owatonna
Smersh, J. F.....Owatonna
Stewart, A. B.....Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Koochiching, Lake of the Woods, Morrison, Todd and Wadena Counties
Regular meetings, Spring, Summer, Fall and Winter
Annual meeting, January
Number of Members: 91

President
House, Z. E.....Cass Lake

Secretary
Badeaux, G. I.....Brainerd

Amundson, A. E.....Little Falls
Anderson, C. E.....Brainerd
Badeaux, G. I.....Brainerd
Beise, R. A.....Brainerd
Borgerson, A. H.....Sebeka
Bosland, H. G.....Verndale
Bowers, J. T.....Bemidji
Burns, H. A.....Ah-Gwah-Ching
Campbell, R. W.....Cass Lake
Cardle, G. E.....Ah-Gwah-Ching
Carlson, C. E.....Aitkin
Cook, J. M.....Staples
Corrigan, J. E.....Spooner
Davis, L. T.....Wadena
Davis, R. D.....Clearbrook
Davis, T. C.....Wadena
Ericsson, M. G.....Long Prairie
Fait, R. V.....Little Falls
Feldman, F. M.....Mankato
Frost, H. T.....Wadena
Garlock, A. V.....Bemidji
Garlock, D. H.....Bemidji
Gerber, M. P.....Brainerd
Ghostley, M. C.....Puposky
Gifford, B. L.....Long Prairie
Grawn, F. A.....Northome
Grogan, J. S.....Wadena
Groschupf, T. P.....Bemidji
Grose, F. N.....Clarissa
Hanover, R. D.....Littlefork
Hanson, E. C.....Park Rapids
Hawkinson, J. P.....Crosby
Hawkinson, L. F.....Brainerd
Healy, R. T.....Pierz
Hendrickson, R. R.....Wadena
Higgs, W. W.....Park Rapids
Holst, C. F.....Little Falls
Holst, J. B.....Little Falls
House, Z. E.....Cass Lake
Hubbard, O. E.....Brainerd

Hubin, E. G.....Deerwood
Jacobson, D. J.....Blackduck
Jamieson, E. F.....Brainerd
Johnson, C. E.....Pine River
Johnson, E. W.....Bemidji
Johnson, V. E.....Walker
Kelly, B. W.....Aitkin
Kerlan, Irvin.....McGregor
Kerlan, S. Z.....Aitkin
Kingston, J. R.....Bemidji
Lamb, H. L.....Little Falls
Laney, R. L.....Fertile
Larson, L. J.....Bagley
Laughlin, J. T.....Grey Eagle
Lenarz, A. J.....Browerville
Marcum, E. H.....Bemidji
Mark, Hilbert.....Walker
Mason, J. A.....International Falls
McCann, D. F.....Bemidji
Mosby, M. E.....Long Prairie
Moyer, R. E.....Minneapolis
Mulligan, A. M.....Brainerd
Nelson, N. P.....Brainerd
Nelson, W. O. B.....Parkers Prairie
Osburn, B. F.....International Falls
Petraborg, H. T.....Aitkin
Pierce, C. H.....Wadena
Potek, David.....International Falls
Quanstrom, V. E.....Brainerd
Reichelderfer, C. F.....Staples
Reynolds, G. S.....Walker
Ringle, O. F.....Walker
Roberts, L. M.....Little Falls
Rosenfield, A. B.....Pequot
Sellers, G. K.....Motley
Shannon, S. S.....Crosby
Simons, E. J.....Swanville
Simons, S. J.....Akeley
Smith, B. A.....Crosby
Spurzem, C. H.....Minneapolis
Stafford, C. E.....Hewitt
Stein, R. J.....Pierz
Thabes, J. A., Jr.....Brainerd
Thabes, J. A., Sr.....Brainerd
Vandersluis, C. W.....Bemidji
Watson, A. M.....Royalton
Watson, J. D.....Holdingford
Watson, P. T.....Cass Lake
Webster, L. J.....Ah-Gwah-Ching
Will, W. W.....Bertha
Withrow, M. E.....International Falls

WABASHA COUNTY MEDICAL SOCIETY

Regular meetings, March, October
Annual meeting, first Thursday after first Monday in October
Number of Members: 10

President
Flesche, B. A.....Lake City
Secretary
Wilson, W. F.....Lake City

Bayley, E. C.....Lake City
Bouquet, B. J.....Wabasha
Cochrane, W. J.....Lake City
Collins, J. S.....Wabasha
Flesche, B. A.....Lake City
Frost, R. H.....Wabasha
Holt, G. W.....Wabasha
Ochsner, C. G.....Wabasha
Slocumb, J. A.....Plainview
Wilson, W. F.....Lake City

WASECA COUNTY MEDICAL SOCIETY

Regular meetings, every three months
Annual meeting, last Friday in December
Number of Members: 10

President
Bernstein, W. C.....New Richland
Secretary
Olds, G. H.....Waseca

Bernstein, W. C.....New Richland
Chadbourn, C. R.....Janesville
Gallagher, B. J.....Waseca
Hottinger, R. C.....Janesville
Lynn, J. F.....Waseca
McIntire, H. M.....Waseca
Oeljen, S. C. G.....Waseca
Olds, G. H.....Waseca
Spittler, R. O.....Fort Snelling
Swenson, O. J.....Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday in January, February, March, April, May, September, October, November and December
Annual meeting second Tuesday in December
Number of Members: 13

President
Stuhr, J. W.....Stillwater
Secretary
Boleyn, E. S.....Stillwater
Boleyn, E. S.....Stillwater

Brooks, G. F.....Stillwater
Ewald, R. P.....Newport
Humphrey, W. R.....Stillwater
Josewski, R. J.....Stillwater
Kalinoff, D.....Stillwater
Linner, Gunnar.....Stillwater
McCarten, F. M.....Stillwater
Mingo, F. E.....Hugo
Poirier, J. A.....Forest Lake
Strand, E. V.....Bayport
Stuhr, J. W.....Stillwater
Van Meier, Henry.....Stillwater

WATONWAN COUNTY MEDICAL SOCIETY

Regular meeting, at call
Annual meeting, December
Number of Members: 8

President
McCarthy, W. J.....Madelia
Secretary
Grimes, H. B.....Madelia

Bergman, O. B.....St. James
Bratrude, E. J.....St. James
Bregel, F. L.....St. James
Grimes, H. B.....Madelia
Hagen, O. E.....Butterfield
Hammar, L. M.....Butterfield
McCarthy, W. J.....Madelia
Thompson, Albert.....St. James

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens, and Traverse Counties
Regular meetings, second Wednesday in January, April, July and October
Annual meeting, second Wednesday in October
Number of Members: 25

President
Lindberg, A. L.....Wheaton
Secretary
Oliver, I. L.....Graceville

Arneson, A. I.....Morris
Bates, B. V.....Browns Valley
Behmler, F. W.....Morris
Bergan, Otto.....Clinton
Bolsta, Charles.....Ortonville
Caine, C. E.....Morris
Cumming, J. F.....Morris
Doleman, N. F.....Tintah
Eberlin, E. A.....Glenwood
Elsey, E. McC.....Glenwood
Elsey, J. R.....Glenwood
Ewing, C. F.....Wheaton
Fitzgerald, E. T.....Morris
Garrow, D. M.....Graceville
Giesen, A. F.....Starbuck
Karn, B. R.....Ortonville
Lindberg, A. L.....Wheaton
Linde, Herman.....Cyrus
McIver, B. A.....Lowry
Mooney, L. P.....Graceville
Nelson, M. C.....Lowry
Oliver, C. I.....Graceville
Oliver, I. L.....Graceville
Ransom, M. L.....Hancock
Shelver, H. J.....Ortonville

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, first Monday in January, April, July, October
Annual meeting, first Monday in January
Number of Members: 26

President
Meinert, A. E.....Winona
Secretary
Steiner, I. W.....Winona

Benoit, F. T.....Winona
Christensen, E. E.....Winona
Crawford, H. L.....Winona
Heise, W. F. C.....Winona
Keyes, J. D.....Winona
Lichtenstein, Hans.....Winona
Lindsay, W. V.....Winona
Mattison, P. A.....Winona
McLaughlin, E. M.....Winona
Meinert, A. E.....Winona
Nauth, W. W.....Winona
Neumann, C. A.....Winona
Nilles, L. J.....Rollingstone
Page, R. L.....St. Charles
Risser, E. D.....Winona
Robbins, C. P.....Winona
Roemer, H. J.....Winona
Roth, F. D.....Lewiston
Satterlee, H. W.....Lewiston
Schaefer, Samuel.....Winona
Steiner, I. W.....Winona
Tweedy, G. J.....Winona
Tweedy, R. B.....Winona
Walker, G. H.....Winona
Wilson, R. H.....Winona
Younger, L. I.....Winona

WRIGHT COUNTY MEDICAL SOCIETY

Regular meeting, Quarterly, first Tuesday after first Monday
Annual meeting, October
Number of Members: 17

President

Anderson, W. P.....Buffalo

Secretary

Catlin, J. J.....Buffalo

Anderson, W. P.....Buffalo

Bendix, L. H.....Annandale
Catlin, J. J.....Buffalo
Catlin, T. J.....Buffalo
Ellison, F. E.....Monticello
Grundset, O. J.....Montrose
Harriman, L.....Howard Lake
Hart, W. E.....Monticello
Hoyer, L. J.....Howard Lake

Lee, J. L.....Watertown
Peterson, O. L.....Cokato
Phillips, A. E.....Delano
Ridgway, A. M.....Annandale
Roholt, C. L.....Waverly
Rousseau, Victor.....Maple Lake
Swezey, B. F.....Buffalo
Thompson, Arthur.....Cokato

ALPHABETIC ROSTER

Aanes, A. M. ..... Red Wing
Abbott, J. S. ..... St. Paul
Aborn, W. H. ..... Hawley
Adams, B. S. ..... Hibbing
Adams, L. P. ..... St. Cloud
Adams, R. C. ..... Bird Island
Adams, R. C. ..... Rochester
Addy, E. R. ..... Gilbert
Adkins, C. M. ..... Thief River Falls
Adkins, G. H. ..... Grygla
Adson, A. W. ..... Rochester
Affeldt, D. E. ..... Kasson
Ahrens, A. E. ..... St. Paul
Ahrens, A. H. ..... St. Paul
Ahrens, R. S. ..... Minneapolis
Aitkens, H. B. ..... Le Center
Akins, W. M. ..... Eveleth
Alberts, M. W. ..... St. Paul
Alden, J. F. ..... St. Paul
Alexander, F. H. ..... St. Paul
Alexander, H. A. ..... Minneapolis
Aling, C. A. ..... Minneapolis
Aling, C. P. ..... Minneapolis
Allen, A. W. ..... Austin
Allen, C. C. ..... Austin
Allen, E. V. ..... Rochester
Allen, H. W. ..... Minneapolis
Allison, R. G. ..... Minneapolis
Altnow, H. O. ..... Minneapolis
Alvarez, W. C. ..... Rochester
Amberg, Samuel ..... Rochester
Amundson, A. E. ..... Little Falls
Andersen, A. G. ..... Minneapolis
Andersen, S. C. ..... Minneapolis
Anderson, C. E. ..... Brainerd
Anderson, C. M. ..... Rochester
Anderson, D. D. ..... Minneapolis
Anderson, E. D. ..... Minneapolis
Anderson, E. R. ..... Minneapolis
Anderson, F. J. ..... Minneapolis
Anderson, J. K. ..... Minneapolis
Anderson, K. W. ..... Minneapolis
Anderson, L. W. ..... Atwater
Anderson, M. J. ..... Rochester
Anderson, P. A. ..... Minneapolis
Anderson, R. E. ..... Willmar
Anderson, S. H. ..... Red Wing
Anderson, U. S. ..... Austin
Anderson, W. P. ..... Buffalo
Anderson, W. S. ..... Minneapolis
Andreassen, E. C. ..... Minneapolis
Andrews, R. N. ..... Mankato
Andrews, R. S. ..... Minneapolis
Annis, H. B. ..... Minneapolis
Annis, J. W. ..... Rochester
Archer, G. F., Jr. ..... Rochester
Arends, A. L. ..... Askov
Arey, S. L. ..... Excelsior
Arlander, C. E. ..... Minneapolis
Armstrong, E. L. ..... Duluth
Armstrong, J. M. ..... St. Paul
Armstrong, T. D. ..... Rochester
Arndt, H. W. ..... Frazee
Arneson, A. I. ..... Morris
Arnold, D. C. ..... Minneapolis
Arnold, E. W. ..... Adrian
Arnquist, A. S. ..... St. Paul
Arnson, J. M. ..... Benson
Arny, F. P. ..... Preston
Arvidson, C. G. ..... Minneapolis
Athens, A. G. ..... Duluth
Aune, Martin ..... Minneapolis
Aurand, W. H. ..... Minneapolis
Aurelius, J. R. ..... St. Paul
Ausman, C. F. ..... St. Paul
Autry, D. H. ..... Rochester
Avery, J. F. ..... La Jolla, Calif.
Ayres, G. T. ..... Ely

Babcock, F. M. ..... Northfield
Backus, A. S. ..... St. Paul
Bacon, D. K. ..... St. Paul
Bacon, L. C. ..... St. Paul
Bacon, R. S. ..... Montevideo
Badeaux, G. I. ..... Brainerd
Baggenstoss, A. H. ..... Rochester
Bagley, E. C. ..... Duluth
Bagley, W. R. ..... Duluth
Bailey, H. B. ..... Fairmont
Bailey, R. J. ..... Rochester
Bair, H. L. ..... Rochester
Baken, M. P. ..... Minneapolis
Baker, A. C. ..... Fergus Falls
Baker, A. T. ..... Minneapolis
Baker, C. P. ..... Rochester
Baker, E. L. ..... Minneapolis
Baker, G. S. ..... Rochester
Baker, H. R. ..... Hayfield
Baker, Looe ..... Minneapolis
Baker, N. H. ..... Fergus Falls
Baker, R. L. ..... Hayfield
Baker, T. W. ..... Rochester
Balfour, D. C. ..... Rochester
Bannick, E. G. ..... Rochester
Barber, J. P. ..... Minneapolis
Bardon, Richard ..... Duluth
Bargen, J. A. ..... Rochester
Barker, N. W. ..... Rochester
Barnes, A. R. ..... Rochester
Barney, L. A. ..... Duluth
Barr, L. C. ..... Albert Lea
Barr, W. H. ..... Wells
Barringer, P. E. ..... St. Cloud
Barron, Moses ..... Minneapolis
Barry, L. W. ..... St. Paul
Barsness, Nellie ..... St. Paul
Basinger, H. P. ..... Windom
Basinger, H. R. ..... Mountain Lake
Bass, G. W. ..... Minneapolis
Bates, B. V. ..... Browns Valley
Batts, Martin, Jr. ..... Rochester
Baxter, S. H. ..... Minneapolis
Bayard, H. F. ..... Minneapolis
Bayley, E. C. ..... Lake City
Beadie, W. D. ..... Cannon Falls
Beals, Hugh ..... St. Paul
Beard, A. H. ..... Minneapolis
*Beard, R. O. ..... Minneapolis
Beckering, Gerrit ..... Edgerton
Beckman, W. G. ..... Minneapolis
Bedard, R. E. ..... Rochester
Bedford, E. W. ..... Minneapolis
Beede, E. R. ..... Faribault
Beek, H. O. ..... St. Paul
Behmler, F. W. ..... Morris
Behrend, Albert ..... Rochester
Beise, R. A. ..... Brainerd
Beiswanger, R. H. ..... Wykoff
Bell, C. C. ..... St. Paul
Bell, E. T. ..... Minneapolis
Belote, G. B. ..... Caledonia
Belzer, M. S. ..... Minneapolis
Bendix, L. H. ..... Annandale
Benedict, W. L. ..... Rochester
Benepe, J. L. ..... St. Paul
Benham, E. W. ..... Mankato
Benjamin, A. E. ..... Minneapolis
Benjamin, E. G. ..... Minneapolis
Benjamin, H. G. ..... Minneapolis
Benjamin, W. G. ..... Pipestone
Benn, F. G. ..... Minneapolis
Bennion, P. H. ..... St. Paul
Benoit, F. T. ..... Winona
Benson, K. W. ..... Rochester
Bentley, N. P. ..... St. Paul
Berdez, G. L. ..... Duluth
Bergan, Otto ..... Clinton
Berge, D. O. ..... Roseau
Berger, A. G. ..... Minneapolis
Bergh, L. N. ..... Montevideo
Bergheim, M. C. ..... Hawley
Berghs, L. V. ..... Owatonna
Bergman, O. B. ..... St. James
Bergquist, K. E. ..... Battle Lake
Berkman, D. M. ..... Rochester
Berkman, J. M. ..... Rochester
Berkwitz, N. J. ..... Minneapolis
Bernstein, W. C. ..... New Richland
Berrisford, P. D. ..... St. Paul
Bertelson, O. L. ..... Crookston
Bessesen, A. N., Jr. ..... Minneapolis
Bessesen, D. H. ..... Minneapolis
Bessesen, W. A. ..... Minneapolis
Betlach, C. J. ..... Rochester
Beuning, J. B. ..... Albany
Bianco, A. J. ..... Duluth
Bicek, J. F. ..... St. Paul
Biedermann, Jacob ..... Thief River Falls
Bigelow, C. E. ..... Dodge Center
Billings, R. E. ..... Franklin
Binet, H. E. ..... Grand Rapids
Binger, H. E. ..... St. Paul
Binger, M. W. ..... Rochester
Birge, H. L. ..... Rochester
Birnberg, T. L. ..... St. Paul
Black, William ..... Mankato
Blacklock, S. S. ..... Hibbing
Blake, James ..... Hopkins
Blake, T. W. ..... Rochester
Blakely, C. C. ..... Barnum
Blakey, A. R. ..... Osakis
Blanchard, H. G. ..... Fairmont
Blaustone, H. H. ..... Minneapolis
Blegen, H. M. ..... Warren
Blomberg, W. R. ..... Princeton
Blum, B. B. ..... Rochester
Blumenthal, J. S. ..... Columbia Heights
Boardman, D. V. ..... Twin Valley
Bock, R. A. ..... St. Paul
Boeckmann, Egil ..... St. Paul
Boehme, E. J. ..... Minneapolis
Bofenkamp, F. W. ..... Luverne
Bohl, G. W. ..... Ada
Bohland, E. H. ..... St. Paul
Boies, L. R. ..... Minneapolis
Bolender, H. L. ..... St. Paul
Boleyn, E. S. ..... Stillwater
Boline, C. A. ..... Battle Lake
Bolsta, Charles ..... Ortonville
Boman, P. G. ..... Duluth
Bong, J. H. ..... Jasper
Booth, A. E. ..... Minneapolis
Boothby, W. M. ..... Rochester
Boquist, E. T. W. ..... Minneapolis
Boreen, C. A. ..... Minneapolis
Borg, J. F. ..... St. Paul
Borgerson, A. H. ..... Sebeka
Borgeson, E. J. ..... Minneapolis
Borreson, Baldwin ..... Thief River Falls
Bosland, H. G. ..... Verndale
Bossert, C. S. ..... Mora
Bossingham, O. N. ..... Lake Benton
Bouma, L. R. ..... St. Paul
Bouman, H. A. H. ..... Minneapolis
Bouquet, B. J. ..... Wabasha
Bowen, R. L. ..... Hibbing
Bowers, J. T. ..... Bemidji
Bowing, H. H. ..... Rochester
Boyd, L. M. ..... Alexandria
Boyer, S. H., Jr. ..... Duluth
Boyer, S. H., Sr. ..... Duluth
Boynton, Ruth ..... Minneapolis
Boysen, Herbert ..... Welcome
Boysen, Peter ..... Pelican Rapids
Braasch, W. F. ..... Rochester
Bracken, H. M. ..... Claremont, Calif.
Brand, G. D. ..... St. Paul
Brand, W. A. ..... Redwood Falls
Branham, D. S. ..... Albert Lea
Branton, A. F. ..... Willmar
Branton, B. J. ..... Willmar
Bratrud, A. F. ..... Minneapolis
Bratrud, O. E. ..... Thief River Falls
Bratrude, E. J. ..... St. James
Braverman, N. J. ..... Duluth
Bray, C. W. ..... Biwabik
Bray, E. R. ..... St. Paul
Bray, P. N. ..... Duluth
Breck, L. W. ..... Rochester
Bregel, F. L. ..... St. James
Brekke, H. J. ..... Minneapolis
Brey, F. W. ..... Wabasso
Brick, E. B. ..... Minneapolis
Briggs, J. F. ..... St. Paul
Brigham, C. F. ..... St. Cloud
Brigham, Frank ..... Watkins
Brink, A. A. ..... Baudette
Brink, J. R. ..... Rochester
Broders, A. C. ..... Rochester
Brodie, W. D. ..... St. Paul
Broker, W. S. ..... Battle Lake
Brooks, C. N. ..... Minneapolis
Brooks, G. F. ..... Stillwater
Brown, A. E. ..... Rochester
Brown, A. H. ..... Pipestone
Brown, E. D. ..... Minneapolis
Brown, E. I. ..... St. Paul
Brown, E. J. ..... Minneapolis
Brown, J. C. ..... St. Paul
Brown, L. L. ..... Crookston
Brown, P. W. ..... Rochester
Brown, R. W. ..... Cambridge
Brownstone, Manuel ..... Sandstone
Brunsting, H. A. ..... Rochester
Brunsting, L. A. ..... Rochester
Brusegard, J. F. ..... Red Wing
Brutsch, G. C. ..... Minneapolis
Bryant, F. L. ..... Minneapolis
Bryant, O. R. ..... Minneapolis
Buchstein, H. F. ..... Rochester
Buchtel, H. A. ..... Rochester
Buck, F. H. ..... Shakopee
Buckley, R. P. ..... Duluth
Buie, L. A. ..... Rochester
Bulinski, T. J. ..... St. Paul
Bulkley, Kenneth ..... Minneapolis
Bullard, M. J. ..... Minneapolis
Burch, F. E. ..... St. Paul

*Deceased

Burnap, W. L. ..... Fergus Falls
Burns, F. M. ..... Milan
Burns, H. A. ..... Ah-Gwah-Ching
Burns, H. D. ..... Albert Lea
Burns, M. A. ..... Milan
Burns, R. L. ..... Two Harbors
Burns, R. M. ..... St. Paul
Burton, C. G. ..... St. Paul
Buscher, J. C. ..... St. Cloud
Busher, H. H. ..... St. Paul
Bussey, C. D. ..... Rochester
Butsch, W. L. ..... Rochester
Butler, John ..... Minneapolis
Butt, H. R. ..... Rochester
Butturff, C. R. ..... Freeborn
Butzer, J. A. ..... Mankato
Buzzelle, L. K. ..... Minneapolis
Byram, J. W. ..... Young America

Cable, M. L. ..... Minneapolis
Cabot, Hugh ..... Rochester
Cabot, V. S. ..... Minneapolis
Cady, L. H. ..... Minneapolis
Caine, C. E. ..... Morris
Caldwell, J. P. ..... St. Paul
Calhoun, F. W. ..... Albert Lea
Callahan, F. F. ..... Pokegama
Callerstrom, G. W. ..... Minneapolis
Cameron, Isabell ..... Minneapolis
Camp, J. D. ..... Rochester
Camp, W. E. ..... Minneapolis
Campbell, L. M. ..... Minneapolis
Campbell, O. J. ..... Minneapolis
Campbell, R. W. ..... Cass Lake
Campbell, S. J. ..... Rochester
Cantwell, W. F. ..... International Falls
Cardle, A. E. ..... Minneapolis
Cardle, G. E. ..... Ah-Gwah-Ching
Carey, J. B. ..... Minneapolis
Carlson, C. E. ..... Aitkin
Carlson, H. A. ..... Minneapolis
Carlson, J. V. ..... Westbrook
Carlson, Lawrence ..... Minneapolis
Carlson, L. A. ..... Rochester
Carlson, L. T. ..... Minneapolis
Carlson, V. W. ..... Blooming Prairie
Carman, J. E. ..... Detroit Lakes
Carmichael, F. A., Jr. ..... Rochester
Caron, R. P. ..... Minneapolis
Carroll, W. C. ..... St. Paul
Carstens, C. F. ..... Hibbing
Catlin, J. J. ..... Buffalo
Catlin, T. J. ..... Buffalo
Cavanor, F. T. ..... Minneapolis
Cervenka, C. F. ..... New Prague
Chadbourn, A. G. ..... Heron Lake
Chadbourn, C. R. ..... Janesville
Chambers, W. C. ..... Blue Earth
Chapman, T. L. ..... Duluth
Chatterton, C. C. ..... St. Paul
Cheney, E. L. ..... Duluth
Chesley, A. J. ..... Minneapolis
Chessen, James ..... Duluth
Chew, E. M. ..... Rochester
Childrey, Edgar, Jr. ..... Rochester
Christensen, E. E. ..... Winona
Christensen, E. P. ..... Two Harbors
Christenson, G. R. ..... Minneapolis
Christiansen, A. ..... St. Paul
Christianson, H. W. ..... Minneapolis
Christison, J. T. ..... St. Paul
Chunn, S. S. ..... Pipestone
Clagett, O. T. ..... Rochester
Clark, F. F. ..... Duluth
Clark, H. B. ..... St. Cloud
Clark, H. B., Jr. ..... St. Paul
Clark, H. H. ..... Edgerton
Clark, H. S. ..... Minneapolis
Clark, L. W. ..... Spring Valley
Clark, R. L., Jr. ..... Rochester
Clark, T. C. ..... Minneapolis
Claydon, D. R. ..... Red Wing
Claydon, H. F. ..... Zumbrota
Claydon, L. E. ..... Red Wing
Clement, J. B. ..... Lester Prairie
Clement, T. G. ..... Duluth
Clement, W. B. ..... Shakopee
Cleveland, W. H. ..... Rochester
Clifford, G. W. ..... Osakis
Clifton, T. A. ..... Chatfield
Cochrane, W. J. ..... Lake City
Coffey, R. J. ..... Rochester
Cohen, S. S. ..... Oak Terrace
Colby, Woodard ..... St. Paul
Cole, H. B. ..... Redwood Falls
Cole, J. G. ..... Redwood Falls
Cole, W. H. ..... St. Paul
Collie, H. G. ..... St. Paul
Collins, A. N. ..... Duluth
Collins, H. C. ..... Duluth

Collins, J. S. ..... Wabasha
Colvin, A. R. ..... St. Paul
Combacker, L. C. ..... Fergus Falls
Comfort, M. W. ..... Rochester
Condit, W. H. ..... Minneapolis
Conner, H. M. ..... Rochester
Connor, C. E. ..... St. Paul
Cook, C. K. ..... St. Paul
Cook, E. N. ..... Rochester
Cook, H. W. ..... Minneapolis
Cook, J. M. ..... Staples
Cooney, H. C. ..... Princeton
Cooper, M. D. ..... Winnebago
Cooperman, H. O. ..... Minneapolis
Corbett, J. F. ..... Minneapolis
Corniea, A. D. ..... Minneapolis
Corrigan, J. E. ..... Spooner
Corwin, W. C. ..... Rochester
Cosgriff, J. A. ..... Bird Island
•Cosman, E. O. ..... Minneapolis
Cottam, Gilbert ..... Minneapolis
Counseller, V. S. ..... Rochester
Countryman, R. S. ..... St. Paul
Covell, W. W. ..... St. Peter
Coventry, W. A. ..... Duluth
Coventry, W. D. ..... Duluth
Cowern, E. W. ..... North St. Paul
Crafts, L. M. ..... Minneapolis
Cragg, R. W. ..... Rochester
Craig, W. McK. ..... Rochester
Cranmer, R. R. ..... Minneapolis
Cranston, R. W. ..... St. Louis Park
Crawford, H. L. ..... Winona
Creevy, C. D. ..... Minneapolis
Creighton, R. H. ..... Minneapolis
Crenshaw, J. L. ..... Rochester
Cress, E. E. ..... Boyd
Cress, P. J. ..... Ellsworth
Crewe, J. E. ..... Rochester
Critchfield, L. R. ..... St. Paul
Cronwell, B. J. ..... Austin
Crow, E. R. ..... Arlington
Culligan, J. M. ..... St. Paul
Culver, L. G. ..... Thief River Falls
Cumming, J. F. ..... Morris
Curtin, J. F. ..... Minneapolis
Curtis, R. A. ..... Le Center
Cusick, P. L. ..... Rochester
Cutler, H. H. ..... Rochester
Cutts, George ..... Minneapolis
Cutts, R. E. ..... Minneapolis

Dack, L. G. ..... St. Paul
Dady, E. E. ..... Minneapolis
Dahl, E. O. ..... Minneapolis
Dahl, G. A. ..... Mankato
Dahl, J. A. ..... Minneapolis
Daignault, Oscar ..... Benson
Daniel, D. H. ..... Minneapolis
Daniel, L. M. ..... Minneapolis
Danielson, K. A. ..... Litchfield
Danielson, Lennox ..... Litchfield
Dart, L. O. ..... Minneapolis
Daugherty, E. B. ..... St. Paul
Daugherty, L. E. ..... St. Paul
Davenport, L. H. ..... Rochester
Davis, A. C. ..... Rochester
Davis, B. F. ..... Duluth
Davis, F. U. ..... Faribault
Davis, Herbert ..... St. Paul
Davis, I. G. ..... Rushford
Davis, J. C. ..... Minneapolis
Davis, L. T. ..... Wadena
Davis, R. D. ..... Clearbrook
Davis, T. C. ..... Wadena
Davis, William ..... St. Paul
Day, L. A. ..... Rochester
Dearing, W. H., Jr. ..... Rochester
DeBoer, Hermanus ..... Edgerton
Dedolph, Karl ..... St. Paul
Dedolph, T. H. ..... Braham
Deeds, C. D. ..... Rochester
Delavan, P. A. ..... St. Paul
Delmore, J. L. ..... Roseau
del Plaine, C. W. ..... Minneapolis
Demo, P. W. ..... Wells
Denman, A. V. ..... Mankato
Derauf, B. I. ..... St. Paul
Desjardins, A. U. ..... Rochester
Devereaux, T. J. ..... Wayzata
Dewey, D. H. ..... Owatonna
Dickson, T. H., Jr. ..... St. Paul
Diehl, H. S. ..... Minneapolis
Diessner, H. D. ..... Minneapolis
Dietrich, F. S., Jr. ..... Rochester
Dittman, G. C. ..... St. Paul
Dixon, C. F. ..... Rochester
Doering, R. E. ..... Minneapolis
Dolan, C. P. ..... Worthington
Dolder, F. C. ..... Eyota
Doleman, N. F. ..... Tintah

Doman, V. W. ..... Lakefield
Doms, H. C. ..... Slayton
Donaldson, C. S. ..... Foley
Donohue, P. F. ..... St. Paul
Donovan, D. L. ..... Albert Lea
Doolittle, L. E. ..... Duluth
Dordal, J. ..... Sacred Heart
Dorge, R. I. ..... Minneapolis
Dornblaser, H. B. ..... Minneapolis
Dorsey, G. C. ..... Minneapolis
Dovre, C. M. ..... St. Paul
Dowswell, W. J. ..... Kerkhoven
Doxey, G. L. ..... Minneapolis
Doyle, G. C. ..... Duluth
Doyle, L. O. ..... Minneapolis
Drake, C. B. ..... St. Paul
Drake, C. R. ..... Minneapolis
Drake, F. A. ..... Lanesboro
Dredge, H. P. ..... Sandstone
Drenning, F. C. ..... Duluth
Drill, H. E. ..... Hopkins
Drips, D. G. ..... Rochester
Drought, W. W. ..... Fergus Falls
Dry, T. J. ..... Rochester
Dubbe, F. H. ..... New Ulm
DuBois, J. A. ..... Sauk Center
DuBois, J. F. ..... Sauk Center
Dudley, J. H. ..... Windom
Duff, E. R. ..... Minneapolis
Dugan, L. F. ..... Faribault
Dukelow, D. A. ..... Minneapolis
Dulude, S. S. ..... Dassel
Dumas, A. G. ..... Minneapolis
Duncan, J. W. ..... Moorhead
Dungay, N. S. ..... Northfield
Dunlap, E. H. ..... Minneapolis
Dunn, G. R. ..... Minneapolis
Dunn, J. N. ..... St. Paul
Duryea, W. M. ..... Minneapolis
Dutton, C. E. ..... Minneapolis
Dvorak, B. A. ..... Minneapolis
Dwan, P. F. ..... Minneapolis
Dworsky, S. D. ..... Minneapolis
Dysterheft, A. F. ..... Gaylord

Earl, G. A. ..... St. Paul
Earl, Robert ..... St. Paul
Eaton, L. McK. ..... Rochester
Eberlin, E. A. ..... Glenwood
Ecker, A. D. ..... Rochester
Eckman, P. F. ..... Duluth
Eckman, R. J. ..... Duluth
Ederer, J. J. ..... Mahnomen
Edlund, G. ..... St. Paul
Edstrom, Henry ..... Dubuque, Iowa
Edwards, G. C. ..... Grove City
Edwards, J. W. ..... St. Paul
Edwards, R. T. ..... Elysian
Edwards, T. J. ..... St. Paul
Ehrenberg, C. J. ..... Minneapolis
Ehrlich, S. P. ..... Minneapolis
Eich, Matthew ..... Minneapolis
Eiler, John ..... St. Bonifacius
Eisenstadt, D. H. ..... Minneapolis
Eitel, G. D. ..... Minneapolis
Ekblad, J. W. ..... Duluth
Eklund, E. J. ..... Norwood
Eklund, W. J. ..... Duluth
Elias, F. J. ..... Duluth
Elkins, E. C. ..... Rochester
Ellingson, A. R. ..... Detroit Lakes
Ellison, D. E. ..... Minneapolis
Ellison, F. E. ..... Monticello
Elsey, E. M. ..... Glenwood
Elsey, J. R. ..... Glenwood
Ely, O. S. ..... South St. Paul
Emanuel, K. W. ..... Duluth
Emerson, E. C. ..... St. Paul
Emmerson, W. S. ..... Mayer
Emmett, J. L. ..... Rochester
Endress, E. K. ..... St. Paul
Engberg, E. J. ..... St. Paul
Engdahl, F. W. ..... Grand Rapids
Engh, Sigfred ..... Jackson
Engstrand, O. J. ..... Minneapolis
Engstrom, G. F. ..... Belgrade
Eppard, R. M. ..... Cloquet
Erdmann, C. A. ..... Minneapolis
Erich, J. B. ..... Rochester
Erickson, C. W. ..... Rochester
Erickson, Eskil ..... Halstad
Erickson, R. F. ..... Minneapolis
Ericson, R. M. ..... Minneapolis
Ericson, Swan ..... Le Sueur
Ericsson, M. G. ..... Long Prairie
Ernest, G. C. ..... South St. Paul
Ertel, E. O. ..... Ellendale
Eshelby, E. C. ..... St. Paul
Esser, John ..... Perham
Estrem, C. O. ..... Fergus Falls
Estrem, T. A. ..... Hibbing

Eusterman, G. B. ..... Rochester
Evans, E. T. ..... Minneapolis
Evans, L. M. ..... Sauk Rapids
Evans, R. D. ..... Minneapolis
Evarts, A. B. ..... Rochester
Ewald, R. P. ..... Newport
Ewens, H. B. ..... Virginia
Ewing, C. F. ..... Wheaton

Faber, J. E. ..... Rochester
Fahey, E. W. ..... St. Paul
Fahr, G. E. ..... Minneapolis
Fairchild, R. D. ..... Rochester
Fait, R. V. ..... Little Falls
Famiglietti, E. V. ..... Rochester
Fankboner, A. V. ..... Buhl
Fansler, W. A. ..... Minneapolis
Farabaugh, C. L. ..... Owatonna
Farthing, J. W. ..... Rochester
Fatherree, T. J., Jr. ..... Rochester
Fawcett, A. M. ..... Renville
Fawcett, C. E. ..... Stewartville
Fawcett, K. R. ..... Duluth
Feeney, J. M. ..... Minneapolis
Feldman, F. M. ..... Mankato
Fellows, M. F. ..... Duluth
Fenger, E. P. K. ..... Oak Terrace
Ferguson, J. C. ..... St. Paul
Fesler, H. H. ..... St. Paul
Fetterly, Warren ..... Minneapolis
Feuling, J. C. ..... Bovey
Fiala, M. J. ..... Duluth
Figi, F. A. ..... Rochester
Fiksdal, M. J. ..... Willmar
Fink, L. W. ..... Minneapolis
Fink, W. H. ..... Minneapolis
Fischer, H. P. ..... Shakopee
Fischer, M. McC. ..... Duluth
Fitzgerald, D. F. ..... Minneapolis
Fitzgerald, E. T. ..... Morris
Fjeldstad, C. A. ..... Minneapolis
Flanagan, H. F. ..... St. Paul
Flanagan, L. G. ..... Austin
Flancher, L. H. ..... Lake Park
Fleming, A. S. ..... Minneapolis
Fleming, T. N. ..... St. Cloud
Flesche, B. A. ..... Lake City
Flinn, T. E. ..... Redwood Falls
Flom, M. G. ..... Zumbrota
Flores, O. T. ..... Dodge Center
Fogarty, C. W. ..... St. Paul
Fogelberg, E. J. ..... St. Paul
Foley, F. E. B. ..... St. Paul
Foley, M. P. ..... Rochester
Folken, F. G. ..... Albert Lea
Folta, John ..... Ceylon
Forbes, R. S. ..... Duluth
Ford, B. C. ..... Marshall
Ford, W. H. ..... Minneapolis
Foshager, H. T. ..... Clara City
Foster, F. P. ..... Rochester
Foster, W. K. ..... Minneapolis
Fowler, L. H. ..... Minneapolis
Franchere, F. W. ..... Lake Crystal
Francis, D. W. ..... Morristown
Fredericks, G. M. ..... Minneapolis
Fredrickson, A. C. ..... Lake Lillian
Fredrickson, G. U. Y. ..... Lake Lillian
Freeman, C. D. ..... St. Paul
Freeman, G. H. ..... St. Peter
Freeman, J. P. ..... Albert Lea
Freeman, W. L. ..... St. Cloud
Freligh, W. P. ..... Albert Lea
Fricke, R. E. ..... Rochester
Friedell, Aaron ..... Minneapolis
Friesleben, William ..... Sauk Rapids
Frisch, F. P. ..... Willmar
Fritsche, Albert ..... New Ulm
Fritsche, C. J. ..... New Ulm
Fritsche, T. R. ..... New Ulm
Fritzell, K. E. ..... Minneapolis
Froats, C. W. ..... Thief River Falls
Frochlich, H. W. ..... Minneapolis
Frost, E. H. ..... Willmar
Frost, H. T. ..... Wadena
Frost, R. H. ..... Wabasha
Fugina, G. R. ..... Mankato
Funk, V. K. ..... Oak Terrace
Furey, E. D. ..... Rochester

Gaarde, F. W. ..... Rochester
Gager, E. C. ..... St. Paul
Gaida, J. B. ..... St. Cloud
Gaines, E. C. ..... Buffalo Lake
Gallagher, B. J. ..... Waseca
Gamble, J. W. ..... Albert Lea
Gamble, P. M. ..... Albert Lea
Gammell, J. H. ..... Minneapolis
Garbrecht, Arthur ..... St. Paul
Gardiner, D. G. ..... St. Paul
Gardner, E. L. ..... Minneapolis
Gardner, V. H. ..... Fairmont
Gardner, W. P. ..... Fergus Falls
Garlock, A. V. ..... Bemidji
Garlock, D. H. ..... Bemidji
Garrett, L. M. ..... Rochester
Garrow, D. M. ..... Graceville
Geer, E. K. ..... St. Paul
Gehlen, J. N. ..... St. Paul
Geist, G. A. ..... St. Paul
Gelz, J. J. ..... St. Cloud
Gendron, J. F. ..... Grand Rapids
Gerber, M. P. ..... Brainerd
Germo, Charles ..... Balaton
Ghent, C. H. ..... St. Paul
Ghormley, R. K. ..... Rochester
Ghostley, M. C. ..... Puposky
Gibbons, F. C. ..... Comfrey
Gibbs, E. C. ..... St. Paul
Gibson, J. K. ..... Tiltonville, Ohio
Gibson, W. R. ..... Rochester
Giere, E. O. ..... Minneapolis
Giere, J. C. ..... Minneapolis
Giere, R. W. ..... Minneapolis
Giere, S. W. ..... Benson
Giesen, A. F. ..... Starbuck
Giessler, P. W. ..... Minneapolis
Giffin, H. Z. ..... Rochester
Gifford, B. L. ..... Long Prairie
Gilfillan, J. S. ..... St. Paul
Gilles, F. L. ..... Minneapolis
Gillespie, D. L. ..... Rochester
Gillespie, M. G. ..... Duluth
Gillespie, N. H. ..... Duluth
Gingold, B. A. ..... Minneapolis
Ginsberg, Harry ..... Minneapolis
Ginsberg, William ..... St. Paul
Giroux, A. A. ..... Duluth
Girvin, R. B. ..... Minneapolis
Gober, O. B. ..... Rochester
Goblirsch, A. P. ..... Sleepy Eye
Goehrs, H. W. ..... St. Cloud
Golberg, M. L. ..... Minneapolis
Golden, C. M. ..... Tyler
Goldish, D. R. ..... Duluth
Goldman, T. I. ..... Minneapolis
Goldstein, Moe ..... Rochester
Goltz, E. V. ..... St. Paul
Good, C. A., Jr. ..... Rochester
Good, H. D. ..... Minneapolis
Goodman, C. E. ..... Virginia
Goss, H. C. ..... Glencoe
Gosslee, G. L. ..... Moorhead
Gowan, L. R. ..... Duluth
Graham, R. W. ..... Rochester
Graham, Robert ..... Duluth
Grant, H. W. ..... St. Paul
Gratzek, F. R. ..... Minneapolis
Gratzek, Thomas ..... St. Paul
Grave, Floyd ..... Minneapolis
Graves, R. B. ..... Red Wing
Graves, W. N. ..... Duluth
Grawn, F. A. ..... Northome
Gray, F. D. ..... Marshall
Gray, H. K. ..... Rochester
Gray, R. C. ..... Minneapolis
*Green, E. K. ..... Minneapolis
Griffin, A. M. ..... Rochester
Griffin, P. J. ..... Fertile
Grimes, B. P. ..... Minneapolis
Grimes, H. B. ..... Madelia
Grimes, Marian ..... Minneapolis
Grise, W. B. ..... Austin
Groff, J. E. ..... Rochester
Grogan, J. S. ..... Wadena
Gronvall, P. R. ..... Minneapolis
Groschupf, T. P. ..... Bemidji
Grose, F. N. ..... Clarissa
Grundset, O. J. ..... Montrose
Gruenhagen, A. P. ..... St. Paul
Guernsey, C. M. ..... Rochester
Gullixson, A. ..... Albert Lea
Gully, R. J. ..... St. Peter
Gunderson, H. J. ..... Rochester
Gunderson, N. A. ..... Minneapolis
Gunderson, R. M. ..... Lake Park
Gurney, C. E. ..... Rochester
Gustason, H. T. ..... Minneapolis

Habein, H. C. ..... Rochester
Haberman, Emil ..... Osakis
Haes, J. E. ..... Vernon Center
Haessly, S. B. ..... Faribault
Hagaman, G. K. ..... St. Paul
Hagen, O. E. ..... Butterfield
Hagen, O. J. ..... Moorhead
Haggard, G. D. ..... Minneapolis
Haight, G. G. ..... Audubon
Haines, D. J., Jr. ..... Rochester
Haines, S. F. ..... Rochester
Halenbeck, P. L. ..... St. Cloud
Hall, A. E. ..... Virginia
Hall, A. R. ..... St. Paul
Hall, B. E. ..... Rochester
Hall, H. H. ..... St. Paul
Hall, J. M. ..... Minneapolis
Hallberg, C. A. ..... Minneapolis
Hallenbeck, D. F. ..... Rochester
Halloran, W. H. ..... Jackson
Halpern, D. J. ..... Brewster
Halpin, J. E. ..... Rush City
Hamel, A. L. ..... Minneapolis
Hamilton, A. S. ..... Minneapolis
Hamlin, G. B. ..... Minneapolis
Hammar, L. M. ..... Butterfield
Hammermeister, T. F. ..... New Ulm
Hammes, E. M. ..... St. Paul
Hammond, A. J. ..... Minneapolis
Hammond, J. F. ..... St. Paul
Hand, W. R. ..... Elbow Lake
Haney, C. L. ..... Duluth
Hankerson, R. G. ..... Minnesota Lake
Hannah, H. B. ..... Minneapolis
Hanover, R. D. ..... Littlefork
Hansen, C. O. ..... Minneapolis
Hansen, E. W. ..... Minneapolis
Hansen, O. S. ..... Minneapolis
Hanson, A. M. ..... Faribault
Hanson, E. C. ..... Park Rapids
Hanson, E. C. ..... New York Mills
Hanson, H. J. ..... Minneapolis
Hanson, H. V. ..... Minneapolis
Hanson, W. A. ..... Minneapolis

Happe, L. J. ..... Marshall
Harmon, G. E. ..... St. Paul
Harriman, L. ..... Howard Lake
Harrington, C. D. ..... Minneapolis
Harrington, F. E. ..... Minneapolis
Harrington, S. W. ..... Rochester
Harris, C. N. ..... Hibbing
Harrison, P. W. ..... Worthington
Hart, V. L. ..... Minneapolis
Hart, W. E. ..... Monticello

Hartfiel, W. F. ..... St. Paul
Hartley, E. C. ..... St. Paul
Hartman, H. R. ..... Rochester
Hartmann, C. M. ..... Fairfax
Haskell, A. D. ..... Alexandria
Hassett, M. F. ..... St. Paul
Hassett, R. G. ..... Mankato
Hastings, D. R. ..... Minneapolis
Hatch, W. E. ..... Duluth
Hathaway, S. J. ..... Proctor
Hauge, M. I. ..... Clarkfield
Hauge, M. M. ..... Clarkfield
Haugen, J. A. ..... Minneapolis
Haugseth, Enoch ..... Twin Valley
Hauser, V. P. ..... St. Paul
Havel, H. W. ..... Jordan
Havens, F. Z. ..... Rochester
Havens, J. G. W. ..... Austin
Haverfield, A. R. ..... Minneapolis
Hawkins, V. J. ..... St. Paul
Hawkinson, J. P. ..... Crosby
Hawkinson, L. F. ..... Brainerd
Hawkinson, R. P. ..... Robbinsdale
Hayes, J. M. ..... Minneapolis
Hayes, M. F. ..... Nashwauk
Haynes, A. L. ..... Faribault
Head, D. P. ..... Minneapolis
Head, G. D. ..... Minneapolis
Healy, R. T. ..... Pierz
Heath, A. C. ..... Stillwater
Hebbel, Robert ..... Windom
Hebeisen, M. B. ..... Chaska
Heck, F. J. ..... Rochester
Heck, W. W. ..... St. Paul
Hedback, A. E. ..... Minneapolis
Hedberg, G. A. ..... Nopeming
Hedenstrom, F. G. ..... St. Paul
Hedenstrom, L. H. ..... Cambridge
Hedin, R. F. ..... Red Wing
Hedlund, C. J. ..... Atwater
Heffner, R. R. ..... Rochester
Hegge, O. H. ..... Austin
Hegge, R. S. ..... Austin
Heiam, W. C. ..... Cook
Heiberg, E. A. ..... Fergus Falls
Heilman, F. R. ..... Rochester
Heim, R. R. ..... Minneapolis
Heimark, J. J. ..... Fairmont
Heimark, O. E. ..... Duluth
Heise, W. F. C. ..... Winona
Helferty, J. K. ..... Tracy
Helk, H. H. ..... Minneapolis
Helland, G. M. ..... Spring Grove
Helland, J. W. ..... Spring Grove
Helm, Standiford ..... Rochester
Helmholz, H. F. ..... Rochester
Hempstead, B. E. ..... Rochester
Hemstead, Werner ..... St. Cloud
Hench, P. S. ..... Rochester
Henderson, A. J. ..... Kiester

*Deceased.

Henderson, M. S. ..... Rochester
Hendricks, E. J. ..... Minneapolis
Hendrickson, J. F. ..... Minneapolis
Hendrickson, R. R. ..... Wadena
Hengstler, W. H. ..... St. Paul
Henney, W. H. ..... McIntosh
Henriksen, H. G. ..... Elko
Henrikson, E. C. ..... Minneapolis
Henry, C. E. ..... Minneapolis
Henry, C. J. ..... Milaca
Henry, M. O. ..... Minneapolis
Hensel, C. N. ..... St. Paul
Henslin, A. E. ..... LeRoy
Henthorne, J. C. ..... Rochester
Herbert, W. L. ..... Granite Falls
Herbolsheimer, A. J. ..... Minneapolis
Herbst, R. F. ..... Minneapolis
Herman, A. L. ..... Minneapolis
Hermanson, P. E. ..... Hendricks
Heron, R. C. ..... St. Paul
Herrell, W. E. ..... Rochester
Herrmann, E. T. ..... St. Paul
Hertel, G. E. ..... Austin
Hertz, C. S. ..... Rochester
Hesselgrave, S. S. ..... St. Paul
Hewitt, E. S. ..... Rochester
Hewitt, R. M. ..... Rochester
Heyerdale, O. C. ..... Rochester
Heyerdale, W. W. ..... Rochester
Hiebert, J. P. ..... Minneapolis
Higgins, J. H. ..... Minneapolis
Higgs, W. W. ..... Park Rapids
Hilding, A. C. ..... Duluth
Hilger, A. W. ..... St. Paul
Hilger, D. D. ..... St. Paul
Hilger, L. A. ..... St. Paul
Hill, E. J. ..... Minneapolis
Hill, F. E. ..... Duluth
Hilleboe, H. E. ..... St. Paul
Hines, E. A., Jr. ..... Rochester
Hiniker, L. P. ..... St. Paul
Hiniker, P. J. ..... Le Sueur
Hinshaw, H. C. ..... Rochester
Hirschboeck, F. J. ..... Duluth
Hirschfelder, A. D. ..... Minneapolis
Hirshfield, F. R. ..... Minneapolis
Hitchings, W. S. ..... Lakefield
Hoaglund, A. W. ..... Minneapolis
Hobbs, C. A. ..... Minneapolis
Hochfilzer, J. J. ..... St. Paul
Hodapp, R. J. ..... Willmar
Hodge, S. V. ..... Minneapolis
Hodgson, C. H. ..... Rochester
Hoff, Alfred ..... St. Paul
Hoff, H. O. ..... Duluth
Hoffert, H. E. ..... Minneapolis
Hoffman, M. H. ..... St. Paul
Hoidale, A. D. ..... Tracy
Holbrook, J. S. ..... Mankato
Holcomb, J. T. ..... St. Paul
Holcomb, O. W. ..... St. Paul
Holdridge, George ..... Foley
Holl, P. M. ..... Minneapolis
Hollands, W. H. ..... Fisher
Holm, H. H. ..... Glencoe
Holm, P. F. ..... Wells
Holmberg, L. J. ..... Canby
Holmes, A. E. ..... Rush City
Holmstrom, C. H. ..... Warren
Holst, C. F. ..... Little Falls
Holst, J. B. ..... Little Falls
Holt, G. W. ..... Wabasha
Holt, J. E. ..... St. Paul
Holt, W. B. ..... Minneapolis
Holtan, Theodore ..... Waterville
Hopkins, G. W. ..... St. Paul
Horton, B. T. ..... Rochester
Hottinger, R. C. ..... Janesville
Houkom, Bjarne ..... Minneapolis
House, Z. E. ..... Cass Lake
Hovde, Rolf ..... Winthrop
Hovland, M. L. ..... Minneapolis
Howard, M. A. ..... St. Paul
Howard, M. I. ..... Mankato
Howard, W. H. ..... Minneapolis
Howard, W. S. ..... St. Paul
Howell, L. P. ..... Rochester
Hoyer, L. J. ..... Howard Lake
Hubbard, O. E. ..... Brainerd
Hubin, E. G. ..... Deerwood
Hubly, J. W. ..... Rochester
Huenekens, E. J. ..... Minneapolis
Huffington, H. L. ..... Mankato
Hullsiek, R. B. ..... St. Paul
Hultkrans, J. C. ..... St. Paul
Hultkrans, R. E. ..... Minneapolis
Humphrey, E. W. ..... Moorhead
Humphrey, W. R. ..... Stillwater
Hunt, A. B. ..... Rochester
Hunt, R. C. ..... Fairmont
Hunte, A. F. ..... Bylas, Ariz.
Hurd, Annah ..... Minneapolis
Hursh, M. M. ..... Cohasset
Hutchinson, C. J. ..... Minneapolis
Hutchinson, Henry ..... Willmar
Huxley, F. R. ..... Faribault
Hymes, Charles ..... Minneapolis
Hynes, J. E. ..... Minneapolis

Ide, A. W. ..... St. Paul
Ikeda, Kano ..... St. Paul
Ingebrigtson, E. K. ..... Moorhead
Ingerson, C. A. ..... St. Paul
Ingham, D. W. ..... Rochester
Irvine, H. G. ..... Minneapolis

Jackman, R. J. ..... Rochester
Jackson, C. M. ..... Minneapolis
Jacobs, A. C. ..... Elmore
Jacobs, D. L. ..... Willmar
Jacobs, G. C. ..... Fergus Falls
Jacobs, J. C. ..... Willmar
Jacobs, L. G., Jr. ..... Madison, Wis.
Jacobson, Clarence ..... Chisholm
Jacobson, D. J. ..... Blackduck
Jacquot, G. I. ..... Marshall
Jamieson, Earl ..... Walnut Grove
Jamieson, E. F. ..... Brainerd
Jennings, F. L. ..... Oak Terrace
Jennings, M. H. ..... Minneapolis
Jensen, A. H. ..... Hutchinson
Jensen, A. M. ..... Brownton
Jensen, Harry ..... Minneapolis
Jensen, H. H. ..... Atwater
Jensen, M. J. ..... Minneapolis
Jensen, R. M. ..... Rochester
Jensen, T. J. ..... Duluth
Jerome, Bourne ..... Emmons
Jesion, J. W. ..... St. Paul
Jewett, R. E. ..... Rochester
Johanson, W. G. ..... St. Paul
Johnson, A. B. ..... Minneapolis
Johnson, A. E. ..... Red Wing
Johnson, A. E. ..... Minneapolis
Johnson, A. M. ..... St. Paul
Johnson, C. E. ..... Pine River
Johnson, C. M. ..... Dawson
Johnson, D. W. ..... Fairmont
Johnson, D. L. ..... Cambridge
Johnson, E. W. ..... Bemidji
Johnson, E. W. ..... Minneapolis
Johnson, Hans ..... Kerkhoven
Johnson, H. A. ..... Minneapolis
Johnson, H. P. ..... Fairmont
Johnson, H. P. ..... Harmony
Johnson, J. A. ..... St. Paul
Johnson, J. A. ..... Minneapolis
Johnson, Julius ..... Minneapolis
Johnson, N. A. ..... Minneapolis
Johnson, Norman ..... Minneapolis
Johnson, N. T. ..... Minneapolis
Johnson, O. H. ..... Redwood Falls
Johnson, O. J. ..... Lyle
Johnson, O. V. ..... Fergus Falls
Johnson, P. C. ..... Tyler
Johnson, R. A. ..... Minneapolis
Johnson, R. B. ..... Lanesboro
Johnson, R. E. ..... Worthington
Johnson, R. G. ..... St. Paul
Johnson, S. M. ..... Minneapolis
Johnson, T. H. ..... San Francisco, Calif.
Johnson, V. E. ..... Walker
Johnson, Walfred ..... Sauk Center
Johnson, W. E. ..... Morgan
Johnson, Y. T. ..... Minneapolis
Johnston, L. F. ..... Minneapolis
Jolin, F. M. ..... Grand Rapids
Jolin, R. V. ..... Grand Rapids
Jones, A. W. ..... Red Wing
Jones, D. C. ..... St. Paul
Jones, E. M. ..... St. Paul
Jones, G. M. ..... Minneapolis
Jones, H. M. ..... Rochester
Jones, H. W. ..... Minneapolis
Jones, R. N. ..... St. Cloud
Jones, W. R. ..... Minneapolis
Jordan, L. S. ..... Granite Falls
Josewich, Alexander ..... Minneapolis
Josewski, R. J. ..... Stillwater
Joyce, G. T. ..... Rochester
Juergens, H. M. ..... Belle Plaine
Juers, E. H. ..... Red Wing
Just, H. J. ..... Lafayettte

Kaasa, L. J. ..... Albert Lea
Kahala, Arthur ..... Crookston
Kahler, J. E. ..... Rochester
Kalin, O. T. ..... Minneapolis
Kalinoff, D. ..... Stillwater
Kamman, G. R. ..... St. Paul
Kannary, E. L. ..... St. Paul
Kamp, B. A. ..... Albert Lea
Kanne, C. W. ..... Faribault
Kaplan, D. H. ..... St. Paul
Karleen, P. E. ..... Boulder Creek, Calif.
Karn, B. R. ..... Ortonville
Kasper, E. M. ..... St. Paul
Kath, R. H. ..... Wood Lake
Katzberg, L. W. ..... Fergus Falls
Kaufman, E. J. ..... Appleton
Kaufman, W. C. ..... Appleton
Kaump, D. H. ..... Rochester
Kearney, R. W. ..... Rochester
Keefe, Rolland ..... St. Paul
Keith, N. M. ..... Rochester
Kelby, G. M. ..... Minneapolis
Kelling, L. F. ..... Lakefield
Kelly, B. W. ..... Aitkin
Kelly, H. M. ..... Rochester
Kelly, J. V. ..... St. Paul
Kelly, P. H. ..... St. Paul
Kelsey, C. G. ..... Hinckley
Kemp, A. F. ..... Mankato
Kemp, M. W. ..... Anoka
Kendahl, A. M. ..... Jasper
Kendrick, T. D. H. ..... Rochester
Kenefick, E. V. ..... St. Paul
Kennedy, C. C. ..... Minneapolis
Kennedy, J. F. ..... Minneapolis
Kennedy, R. L. J. ..... Rochester
Kennedy, W. A. ..... St. Paul
Kepler, E. J. ..... Rochester
Kerkhof, A. C. ..... Minneapolis
Kerlan, Irvin ..... McGregor
Kerlan, S. Z. ..... Aitkin
Kermott, L. H., Jr. ..... Rochester
Kern, M. J. ..... St. Cloud
Kernohan, J. W. ..... Rochester
Kerr, J. G. ..... Rochester
Kerschbaumer, Louisa ..... St. Peter
Kertesz, G. ..... Minneapolis
Kesting, Herman ..... St. Paul
Kettlewell, R. B. ..... Sauk Center
Keyes, C. R. ..... Duluth
Keyes, J. D. ..... Winona
Kibbe, O. A. ..... Minneapolis
Kierland, P. E. ..... Alexandria
Kiesling, I. H. ..... Nashwauk
Kilbride, E. A. ..... Worthington
Kilbride, J. S. ..... Worthington
King, E. A. ..... Minneapolis
King, G. L. ..... St. Paul
King, H. T. ..... Minneapolis
King, Z. P. ..... St. Paul
Kingsbury, E. M. ..... Clearwater
Kingston, J. R. ..... Bemidji
Kinsella, T. J. ..... Minneapolis
Kirk, G. P. ..... East Grand Forks
Kirklin, B. R. ..... Rochester
Kirklin, O. L. ..... Rochester
Kistler, A. J. ..... Minneapolis
Kistler, C. M. ..... Minneapolis
Klein, A. D., Jr. ..... Chisholm
Klein, Harry ..... Duluth
Klein, H. N. ..... St. Paul
Klein, J. C. ..... Shakopee
Klima, W. W. ..... Stewart
Knapp, F. N. ..... Duluth
Knapp, M. E. ..... Minneapolis
Knauff, M. K. ..... St. Paul
Knepper, P. A. ..... Rochester
Knight, R. R. ..... Minneapolis
Knight, R. T. ..... Minneapolis
Knutson, G. A. ..... Greenbush
Koelsche, G. A. ..... Rochester
Koepcke, G. M. ..... Minneapolis
Kohlbry, C. O. ..... Duluth
Kohler, D. W. ..... St. Joseph
Kolars, J. J. ..... Le Center
Koller, H. M. ..... Minneapolis
Koller, L. R. ..... Minneapolis
Kolset, C. D. ..... Sanborn
Kooiker, H. J. ..... Hill City
Koop, S. H. ..... Richmond
Kortsch, F. P. ..... Prior Lake
Kotchevar, F. R. ..... Eveleth
Kowallis, G. F. ..... Rochester
Kraft, H. C. ..... Rochester
Kraft, Peter ..... Duluth
Krantz, C. I. ..... Duluth
Kreuzer, T. C. ..... Owatonna
Krusen, F. H. ..... Rochester
Kucera, F. J. ..... Hopkins
Kucera, S. T. ..... Lonsdale
Kucera, W. J. ..... Minneapolis
Kugler, A. A. ..... St. Paul
Kuhlmann, August ..... Melrose
Kusske, A. L. ..... New Ulm
Kuth, J. R. ..... Duluth
Kvale, W. F. ..... Rochester
Kvitrud, Gilbert ..... St. Paul

Laird, A. T. ..... Nopeming
Laird, D. R. ..... Rochester
Lajoie, J. M. ..... Minneapolis
Lamb, H. L. ..... Little Falls
Lamont, J. G. ..... Minneapolis
Laney, R. L. ..... Fertile
Lang, L. A. ..... Minneapolis
Langenderfer, F. V. ..... St. Paul
Langhoff, A. H. ..... Glencoe
Lannin, J. C. ..... Mabel
Lapierre, A. P. ..... Minneapolis
Lapierre, C. A. ..... Minneapolis
Lapierre, J. T. ..... Minneapolis
Larsen, C. L. ..... St. Paul
Larsen, F. W. ..... Minneapolis
Larsen, O. O. ..... Detroit Lakes
Larson, Arnold ..... Detroit Lakes
Larson, C. M. ..... Minneapolis
Larson, J. T. ..... Lake Wilson
Larson, L. J. ..... Bagley
Larson, L. M. ..... Minneapolis
Larson, L. M. ..... Oak Terrace
Larson, P. N. ..... Minneapolis
Laughlin, J. T. ..... Grey Eagle
LaVake, R. T. ..... Minneapolis
Lax, M. H. ..... St. Paul
Laymon, C. W. ..... Minneapolis
Lazar, H. L. ..... Minneapolis
Leahy, Bartholomew ..... St. Paul
Leavenworth, R. O. ..... St. Paul
Leavitt, H. H. ..... Minneapolis
Lebowske, J. A. ..... Minneapolis
Leck, P. C. ..... Austin
Leddy, E. T. ..... Rochester
Lee, H. M. ..... Minneapolis
Lee, J. L. ..... Watertown
Lee, W. A. ..... Fergus Falls
Lee, W. N. ..... Madison
Leibold, H. H. ..... Parkers Prairie
Leitch, Archibald ..... St. Paul
Leitch, N. M. ..... Warroad
Leland, H. R. ..... Minneapolis
Leland, J. T. ..... Herman
Lemon, R. G. ..... Rochester
Lemon, W. S. ..... Rochester
Lenander, M. E. ..... St. Peter
Lenarz, A. J. ..... Browerville
Lende, Norman ..... Faribault
Lenont, C. B. ..... Virginia
Lenton, H. P. ..... Rochester
Lenz, J. R. ..... Morton
Lenz, O. A. ..... Minneapolis
Leonard, G. J. ..... Hastings
Leonard, L. J. ..... Minneapolis
Leonard, Sam ..... Minneapolis
Leopard, B. A. ..... Albert Lea
Lepak, F. J. ..... Duluth
Lepak, J. A. ..... St. Paul
Lerche, William ..... Cable, Wisconsin
Leven, N. L. ..... St. Paul
Levi, Sam ..... Ely
Levin, Bert ..... St. Paul
Levine, N. M. ..... Minneapolis
Lewis, A. J. ..... Henning
Lewis, C. B. ..... St. Cloud
Lewis, E. B. ..... Rochester
Lexa, F. J. ..... Lonsdale
Libert, J. N. ..... St. Cloud
Lichtenstein, Hans ..... Winona
Lick, C. L. ..... St. Paul
Liedloff, A. G. ..... Mankato
Liffrig, W. W. ..... Goodhue
Lightbourn, E. T. ..... Jordan
Lillehei, E. J. ..... Robbinsdale
Lillie, H. I. ..... Rochester
Lima, Ludvig ..... Montevideo
Lind, C. J. ..... Minneapolis
Lindahl, M. J. ..... Jasper
Lindberg, A. L. ..... Wheaton
Linde, Herman ..... Cyrus
Lindquist, R. H. ..... Minneapolis
Lindsay, W. V. ..... Winona
Linner, Gunnar ..... Stillwater
Linner, H. P. ..... Minneapolis
Linton, W. B. ..... Minneapolis
Lippman, E. S. ..... Minneapolis
Lippman, H. S. ..... St. Paul
Lippmann, E. W. ..... Hutchinson
Lipschultz, Oscar ..... Minneapolis
Lipscomb, W. R. ..... Rochester
Litman, A. B. ..... Minneapolis
Litman, S. N. ..... Duluth
Little, W. J. ..... St. Paul
Litzenberg, J. C. ..... Minneapolis
Livingstone, J. W. ..... Hudson, Wis.
Lloyd, H. J. ..... Mankato
Lloyd, S. J. ..... Rochester
Lochead, D. C. ..... Rochester

*Locken, O. E. ..... Crookston
Loenholdt, E. H. ..... Hector
Logan, A. H. ..... Rochester
Logan, F. W. ..... Blue Earth
Logefeil, R. C. ..... Minneapolis
Lohmann, J. G. ..... Jasper
Lommen, P. A. ..... Austin
Long, Jesse ..... Minneapolis
Loofbourrow, E. H. ..... Keewatin
Loomis, E. A. ..... Minneapolis
Lord, G. A. ..... Rochester
Love, F. A. ..... Carlos
Love, J. G. ..... Rochester
Lovelady, S. B. ..... Rochester
Lowe, E. R. ..... South St. Paul
Lowe, Thomas ..... Pipestone
Lowe, T. A. ..... South St. Paul
Luden, Georgine, Victoria, B. C., Canada
Luedtke, G. H. ..... Fairmont
Lufkin, C. D. ..... Northfield
Lund, C. J. T. ..... Underwood
Lundblad, R. A. ..... Minneapolis
Lundgren, A. C. ..... Minneapolis
Lundholm, A. M. ..... St. Paul
Lundquist, C. W. ..... Hibbing
Lundquist, E. F. ..... Minneapolis
Lundy, J. S. ..... Rochester
Lyght, C. E. ..... Northfield
Lynch, F. W. ..... St. Paul
Lynch, M. J. ..... Minneapolis
Lynde, O. G. ..... Thief River Falls
Lynn, J. F. ..... Waseca
Lyon, E. P. ..... Minneapolis
Lysne, Henry ..... Minneapolis

Macbeth, J. L. ..... St. Clair
MacDonald, A. E. ..... Minneapolis
MacDonald, D. A. ..... Minneapolis
MacDonald, I. C. ..... Minneapolis
Macey, H. B. ..... Rochester
Macfarlane, P. H. ..... Chisholm
Mach, F. B. ..... Minneapolis
Mack, J. J. ..... Fordyce, Arkansas
MacKenzie, W. C. ..... Rochester
Macklin, W. E. ..... Litchfield
MacLean, A. R. ..... Rochester
Macnie, J. S. ..... Minneapolis
MacRae, G. C. ..... Duluth
Madden, J. F. ..... St. Paul
Madland, R. S. ..... Fairfax
Maertz, W. F. ..... New Prague
Magath, T. B. ..... Rochester
Magiera, E. A. ..... Rochester
Magney, F. H. ..... Duluth
Mahowald, A. ..... Albany
Maitland, D. P. ..... Jackson
Maitland, E. T. ..... Jackson
Maksim, George, Jr. ..... Rochester
Maland, C. O. ..... Minneapolis
Malerich, J. A. ..... Caledonia
Malmstrom, J. A. ..... Virginia
Manley, J. R. ..... Duluth
Mann, A. S., Jr. ..... Rochester
Mann, F. C. ..... Rochester
Manson, F. M. ..... Worthington
Marcley, D. M. ..... Rochester
Marcley, W. J. ..... Minneapolis
Marcum, E. H. ..... Bemidji
Mariette, E. S. ..... Oak Terrace
Mark, D. B. ..... Minneapolis
Mark, Hilbert ..... Walker
Markoe, J. C. ..... St. Paul
Martin, E. T. ..... Duluth
Mohn ..... April 20
Martin, T. P. ..... Arlington
Martin, W. C. ..... Duluth
Martineau, J. L. ..... St. Paul
Martinson, C. J. ..... Wayzata
Mason, J. A. ..... International Falls
Mason, L. K. ..... Rochester
Masson, D. M. ..... Rochester
Masson, J. C. ..... Rochester
Matchan, G. R. ..... Minneapolis
Matthews, Justus ..... Minneapolis
Mattill, P. M. ..... Oak Terrace
Mattison, P. A. ..... Winona
Mattson, C. H. ..... St. Paul
Mattson, Haml'n ..... Minneapolis
Maxeiner, S. R. ..... Minneapolis
May, W. H. ..... Minneapolis
Mayland, M. L. ..... Faribault
Mayne, R. M. ..... Duluth
Mayo, C. H. ..... Rochester
Mayo, C. W. ..... Rochester
Mayo, W. J. ..... Rochester
Maytum, C. K. ..... Rochester
McBroom, D. E. ..... Cambridge
McCann, D. F. ..... Bemidji
McCann, E. J. ..... Minneapolis

McCarten, F. M. ..... Stillwater
McCarthy, Donald ..... Minneapolis
McCarthy, J. J. ..... St. Paul
McCarthy, W. J. ..... Madelia
McCarthy, W. R. ..... St. Paul
McCartney, J. S. ..... Minneapolis
McCarty, P. D. ..... Ely
McCarty, W. C. ..... Rochester
McClanahan, J. H. ..... White Bear
McClanahan, T. S. ..... White Bear
McComb, C. F. ..... Duluth
McCoy, M. K. ..... Duluth
McCrea, J. M. ..... Fulda
McDaniel, Orianna ..... Minneapolis
McDaniel, S. P. ..... Virginia
McDonald, A. L. ..... Duluth
McDonald, J. R. ..... Rochester
McDowell, J. P. ..... St. Cloud
McElmeel, E. F. ..... Pipestone
McEnaney, C. T. ..... Owatonna
McFarland, A. H. ..... Minneapolis
McGandy, R. F. ..... Minneapolis
McGeary, G. E. ..... Minneapolis
McGowan, J. M. ..... Rochester
McGregor, Catherine ..... Minneapolis
McGroarity, J. J. ..... Easton
McGuigan, H. T. ..... Red Wing
McHaffie, O. L. ..... Duluth
McInerny, Maurice ..... Minneapolis
McIntire, H. M. ..... Waseca
McIntyre, George ..... Minneapolis
McIntyre, J. A. ..... Owatonna
McIver, B. A. ..... Lowry
McKaig, C. B. ..... Pine Island
McKean, R. S. ..... Rochester
McKenna, J. K. ..... Austin
McKenzie, C. H. ..... Minneapolis
McKeon, J. O. ..... Montgomery
McKinlay, C. A. ..... Minneapolis
McKinley, J. C. ..... Minneapolis
McKinney, F. S. ..... Minneapolis
McLane, E. G. ..... Jackson
McLane, W. O. ..... Jackson
McLaren, J. M. ..... St. Paul
McLaughlin, E. M. ..... Winona
McLeod, J. L. ..... Grand Rapids
McMahon, M. J. ..... Green Isle
McNevin, C. F. ..... St. Paul
McNutt, J. R. ..... Duluth
McPheeters, H. O. ..... Minneapolis
McQuarrie, Irvine ..... Minneapolis
Mead, C. H. ..... Duluth
Meade, J. R. ..... St. Paul
Mears, B. J. ..... St. Paul
Meckstroth, C. W. ..... Brandon
Mecray, P. M., Jr. ..... Rochester
Medelman, J. P. ..... St. Paul
Mee, P. H. ..... Osseo
Meinert, A. E. ..... Winona
Meland, E. L. ..... Minneapolis
Melby, Benedik ..... Blooming Prairie
Mellby, O. F. ..... Thief River Falls
Melzer, G. R. ..... Lyle
Mercil, W. F. ..... Crookston
Merkert, C. E. ..... Minneapolis
Merkert, G. L. ..... Minneapolis
Merrill, Elisabeth ..... Minneapolis
Merriman, L. L. ..... Duluth
Merrit, W. A. ..... Albert Lea
Mesker, G. H. ..... Olivia
Meyer, A. A. ..... Melrose
Meyer, E. L. ..... Minneapolis
Meyer, F. C. ..... Kenyon
Meyer, P. F. ..... Faribault
Meyerding, E. A. ..... St. Paul
Meyerding, H. W. ..... Rochester
Michael, J. C. ..... Minneapolis
Michel, H. H. ..... Minneapolis
Michelson, H. E. ..... Minneapolis
Miller, F. J. ..... Spokane, Wash.
Miller, H. A. ..... Fairmont
Miller, H. E. ..... Minneapolis
Miller, J. C. ..... Minneapolis
Miller, J. M. ..... Rochester
Miller, V. I. ..... Mankato
Miller, W. A. ..... New York Mills
Mills, J. H. ..... Tacoma, Wash.
Mills, J. L. ..... Winnebago
Milton, J. S. ..... Minneapolis
Mingo, F. E. ..... Hugo
Mitchell, E. C. ..... Mound
Mitchell, R. S. ..... Grand Meadow
Moberg, C. W. ..... Lake Park
Moe, J. H. ..... Minneapolis
Moe, R. J. ..... Duluth
Moe, Thomas ..... Moose Lake
Moersch, F. P. ..... Rochester
Moersch, H. J. ..... Rochester
Moga, J. A. ..... St. Paul
Mogilner, S. N. ..... St. Paul

*Deceased

Moir, W. W. ..... Minneapolis
Molander, H. A. ..... St. Paul
Monroe, P. B. ..... Two Harbors
Monson, L. J. ..... Hendricks
Montgomery, Hamilton ..... Rochester
Montgomery, T. R. ..... Rochester
Mooney, L. P. ..... Graceville
Moore, F. H. ..... Rochester
Moorhead, M. B. ..... Minneapolis
Moquin, M. A. ..... St. Paul
Moran, T. R. ..... St. Paul
More, C. W. ..... Eveleth
Morehead, D. E. ..... Owatonna
Moren, Edward ..... Minneapolis
Morgan, H. O., Jr. ..... Amboy
Morgan, H. P. ..... St. Cloud
Moriarty, Berenice ..... St. Paul
Moriarty, C. R. ..... Minneapolis
Mork, B. O. ..... Worthington
Mork, B. O., Jr. ..... Worthington
Morley, G. A. ..... Crookston
Morlock, C. G. ..... Rochester
Morrison, A. W. ..... Minneapolis
Morrissey, F. B. ..... St. Paul
Morrow, J. J. ..... Austin
Morse, M. P. ..... Le Roy
Morse, R. W. ..... Minneapolis
Morsman, L. W. ..... Hibbing
Morss, C. R. ..... Zumbrota
Mortensbak, H. E. ..... Hanska
Mortenson, N. G. ..... St. Paul
Morton, H. McI. ..... Vincentown, N. J.
Mosby, M. E. ..... Long Prairie
Moses, Joseph, Jr. ..... Northfield
Moses, R. R. ..... Kenyon
Mouritsen, G. J. ..... Fergus Falls
Mousel, L. H. ..... Rochester
Moyer, R. E. ..... Minneapolis
Moynihan, A. F. ..... Sauk Center
Moynihan, T. J. ..... St. Paul
Mueller, S. C. ..... Duluth
Muller, R. T. ..... St. Paul
Mulligan, A. M. ..... Brainerd
Mulrooney, R. E. ..... Rochester
Mundell, B. J. ..... Rochester
Murdoch, J. M. ..... Faribault
Murphy, I. J. ..... Minneapolis
Mussey, R. D. ..... Rochester
Myers, J. A. ..... Minneapolis
Myers, Thomas ..... St. Paul
Myre, C. R. ..... Paynesville

Naegeli, A. E. ..... St. Paul
Naegeli, Frank ..... Fergus Falls
Nagel, H. D. ..... Waconia
Naslund, A. W. ..... St. Paul
Nass, H. A. ..... Mabel
Nauth, W. W. ..... Winona
Neal, J. M. ..... Minneapolis
Nealy, D. E. ..... Adrian
Neary, R. P. ..... Minneapolis
Neel, H. B. ..... Rochester
Neher, F. H. ..... St. Paul
Nelson, E. H. ..... Chisholm
Nelson, E. J. ..... Owatonna
Nelson, H. E. ..... Crookston
Nelson, Harvey ..... Minneapolis
Nelson, H. S. ..... Minneapolis
Nelson, L. A. ..... St. Paul
Nelson, M. C. ..... Lowry
Nelson, M. S. ..... Granite Falls
Nelson, N. P. ..... Brainerd
Nelson, O. E. ..... Minneapolis
Nelson, R. L. ..... Duluth
Nelson, W. I. ..... Minneapolis
Nelson, W. O. B. ..... Parkers Prairie
Ness, C. M. ..... Cambridge
Nesselrod, J. P. ..... Rochester
Nettrour, W. S. ..... Austin
Neumann, C. A. ..... Winona
New, G. B. ..... Rochester
Newhart, Horace ..... Minneapolis
Nichols, A. E. ..... St. Paul
Nicholson, M. A. ..... Duluth
Nilles, L. J. ..... Rollingstone
Nilson, H. J. ..... North Mankato
Ninneman, N. N. ..... Silver Lake
Noble, J. F. ..... St. Paul
Noble, J. L. ..... St. Paul
Noonan, D. F. ..... Minneapolis
Nordin, G. T. ..... Minneapolis
Nordland, Martin ..... Minneapolis
Nordman, W. F. ..... Mora
Norman, J. F. ..... Crookston
Norrgard, H. T. ..... Milaca
Noth, H. W. ..... Minneapolis
Novak, E. E. ..... New Prague
Nuessle, W. G. ..... Springfield
Nuetzman, A. W. ..... Faribault

Nutting, R. E. ..... Duluth
Nye, K. A. ..... St. Paul
Nye, L. L. ..... St. Paul
Nygren, W. T. ..... Braham
Nystrom, Ruth ..... Minneapolis

Oberg, C. M. ..... Minneapolis
O'Brien, W. A. ..... Minneapolis
Ochsner, C. G. ..... Wabasha
O'Connor, L. J. ..... St. Paul
Odel, H. M. ..... Rochester
Odessky, Louis ..... Pine River
O'Donnell, J. E. ..... Minneapolis
Oeljen, S. C. G. ..... Waseca
Oerting, Harry ..... St. Paul
Ogden, Warner ..... St. Paul
Ohage, Justus, Jr. ..... St. Paul
Ohnstad, J. L. ..... McIntosh
Olds, G. H. ..... Waseca
O'Leary, P. A. ..... Rochester
Oliver, C. I. ..... Graceville
Oliver, I. L. ..... Graceville
Olsen, A. M. ..... Rochester
Olson, A. E. ..... Duluth
Olson, C. A. ..... St. Paul
Olson, C. J. ..... Belle Plaine
Olson, E. A. ..... Pine Island
Olson, F. A. ..... Minneapolis
Olson, G. E. ..... West Concord
Olson, K. L. ..... Gibbon
Olson, O. A. ..... Minneapolis
Olson, R. G. ..... Minneapolis
Olson, W. P. ..... Gaylord
Onsgard, L. K., Jr. ..... Houston
Onsgard, L. K., Sr. ..... Houston
Oppegaard, C. L. ..... Crookston
Oppegaard, M. O. ..... Crookston
Oppen, E. G. ..... Minneapolis
O'Reilley, B. E. ..... St. Paul
Ormond, D. T. ..... Waconia
Osborn, Lida ..... Mankato
Osburn, B. F. ..... International Falls
Ostergren, E. W. ..... St. Paul
Otto, H. C. ..... Frazee
Ouelette, A. J. ..... St. Paul
Owre, Oscar ..... Minneapolis

Page, C. V. ..... St. Paul
Page, R. L. ..... St. Charles
Palmer, C. F. ..... Albert Lea
Palmer, W. L. ..... Albert Lea
Pankratz, P. J. ..... Mountain Lake
Paradis, W. G. ..... Crookston
Parker, O. W. ..... Ely
Parker, R. L. ..... Rochester
Parkhill, E. M. ..... Rochester
Parks, A. H. ..... Minneapolis
Parson, E. L. B. ..... Elbow Lake
Parson, L. R. ..... Elbow Lake
Parsons, J. G. ..... Crookston
Pasek, A. W. ..... Lismore
Passer, A. A. ..... Olivia
Patterson, W. E. ..... Minneapolis
Patterson, W. E. ..... Westbrook
Patterson, W. L. ..... Fergus Falls
Paulsen, E. L. ..... Minneapolis
Paulson, T. S. ..... Fergus Falls
Pearce, N. O. ..... Minneapolis
Pearsall, R. P. ..... Virginia
Pearson, B. F. ..... Shakopee
Pearson, F. R. ..... St. Paul
Pedersen, A. H. ..... St. Paul
Pemberton, J. deJ. ..... Rochester
Penhall, F. W. ..... Morton
Penn, G. E. ..... Mankato
Pennie, D. F. ..... Duluth
Pennington, Reuben ..... Minneapolis
Peppard, T. A. ..... Minneapolis
Perozzi, Thelma ..... Rochester
Perry, C. G. ..... St. Paul
Perry, R. St. J. ..... Minneapolis
Persons, C. E. ..... Marshall
Pertl, A. L. ..... Canby
Petersen, J. R. ..... Minneapolis
Petersen, M. C. ..... Willmar
Petersen, P. C. ..... Braham
Petersen, Thorvald ..... Minneapolis
Peterson, A. A. ..... Mora
Peterson, D. B. ..... St. Paul
Peterson, D. L. ..... Rochester
Peterson, E. N. ..... Virginia
Peterson, Henry ..... Minneapolis
Peterson, H. W. ..... Minneapolis
Peterson, J. H. ..... Duluth
Peterson, J. L. E. ..... St. Paul
Peterson, N. P. ..... Minneapolis
Peterson, O. H. ..... Minneapolis
Peterson, O. L. ..... Cokato
Peterson, P. E. ..... Minneapolis
Peterson, R. A. ..... Vesta
Peterson, V. N. ..... St. Paul

Peterson, W. C. ..... Minneapolis
Petit, L. J. ..... Minneapolis
Petraborg, H. T. ..... Aitkin
Petter, C. K. ..... Oak Terrace
Pettit, C. W. ..... Minneapolis
Peyton, W. T. ..... Minneapolis
Pfunder, M. C. ..... Minneapolis
Phelps, K. A. ..... Minneapolis
Phillips, A. E. ..... Delano
Phillips, W. H. ..... Jordan
Pierce, C. H. ..... Wadena
Pilcher, Frederick, Jr. ..... Rochester
Piper, M. C. ..... Rochester
Piper, W. A. ..... Mountain Lake
Platou, E. S. ..... Minneapolis
Plondke, F. J. ..... St. Paul
Plonske, C. J. ..... Faribault
Plowman, E. T. ..... Calumet
Plummer, W. A. ..... Rochester
Pogue, R. E. ..... Glendale, Calif.
Poirier, J. A. ..... Forest Lake
Pollard, D. W. ..... Minneapolis
Pollock, D. K. ..... Minneapolis
Pollock, L. W. ..... Rochester
Polzak, J. A. ..... Minneapolis
Pool, T. L. ..... Rochester
Popp, W. C. ..... Rochester
Poppe, F. H. ..... Minneapolis
Portmann, W. C. ..... Jackson
Potek, David ..... International Falls
Power, J. E. ..... Duluth
Powers, F. W. ..... Barrett
Prangen, A. D. ..... Rochester
Pratt, F. J. ..... Minneapolis
Pratt, J. A. ..... Minneapolis
Preine, I. A. ..... Minneapolis
Prendergast, H. J. ..... St. Paul
Prendergast, J. J. ..... St. Paul
Prickman, L. E. ..... Rochester
Priest, R. E. ..... Worthington
Priestley, J. T. ..... Rochester
Prim, J. A. ..... Minneapolis
Prins, L. R. ..... Albert Lea
Proeschel, R. K. ..... Kimball
Proshek, C. E. ..... Minneapolis
Purves, G. H. ..... Russell
Puumala, R. H. ..... Cloquet

Quanstrom, V. E. ..... Brainerd
Quinby, T. F. ..... Minneapolis
Quist, H. W. ..... Minneapolis

Raadquist, C. S. ..... Hibbing
Radabaugh, R. C. ..... Hastings
Raiter, F. W. S. ..... Cloquet
Raiter, R. F. ..... Cloquet
Ramsey, W. R. ..... St. Paul
Randall, A. M. ..... Ashby
Randall, L. M. ..... Rochester
Ransom, M. L. ..... Hancock
Rasmussen, R. C. ..... St. Paul
Rathbun, C. A. ..... St. Cloud
Raymond, J. H. ..... Triumph
Reed, C. A. ..... Minneapolis
Reeve, E. T. ..... Elbow Lake
Reff, A. R. ..... Crookston
Regan, J. F. ..... Rochester
Regnier, E. A. ..... Minneapolis
Reichelderfer, C. F. ..... Staples
Reineke, G. F. ..... New Ulm
Reiter, H. W. ..... Shakopee
Rewbridge, A. G. ..... Minneapolis
Reynolds, G. S. ..... Walker
Reynolds, J. S. ..... Minneapolis
Rhorer, R. J. ..... Rochester
Rice, C. O. ..... Minneapolis
Rice, H. G. ..... Moorhead
Rice, H. R. ..... Roseau
Richards, E. T. F. ..... St. Paul
Richards, W. B. ..... St. Cloud
Richardson, F. S. ..... Minneapolis
Richardson, H. E. ..... St. Paul
Richdorf, L. F. ..... Minneapolis
Richmond, C. D. ..... Jeffers
Rickey, G. L. ..... Rochester
Ridgway, A. M. ..... Annandale
Ridgway, Alexander ..... South Haven
Rieke, W. W. ..... Wayzata
Rigler, L. G. ..... St. Paul
Riley, J. B. ..... Fergus Falls
Rimer, E. W. ..... Breckenridge
Ringle, O. F. ..... Walker
Rishmiller, J. H. ..... Minneapolis
Risser, A. F. ..... Stewartville
Risser, E. D. ..... Winona
Ritchie, H. P. ..... St. Paul
Ritt, A. E. ..... St. Paul
Rivers, A. B. ..... Rochester
Rizer, R. I. ..... Minneapolis
Roan, C. M. ..... Minneapolis

Robb, E. F. ..... Minneapolis
Robbins, C. P. ..... Winona
Roberts, L. M. ..... Little Falls
Roberts, O. W. ..... Owatonna
Roberts, S. W. ..... Minneapolis
Roberts, T. S. ..... Minneapolis
Roberts, W. B. ..... Minneapolis
Robertson, H. E. ..... Rochester
Robertson, J. B. ..... Minneapolis
Robertson, P. A. ..... Austin
Robilliard, C. M. ..... Faribault
Robinson, J. M. ..... Duluth
Robitshek, E. C. ..... Minneapolis
Rochford, W. E. ..... Minneapolis
Rodda, F. C. ..... Minneapolis
Rodgers, C. L. ..... Minneapolis
Roehlke, A. B. ..... Elk River
Roemer, H. J. ..... Winona
Rogers, J. T. ..... St. Paul
Rogers, S. F. ..... St. Paul
Roholt, C. L. ..... Waverly
Rohrer, C. A. ..... Waterville
Rose, J. T. ..... Lakefield
Rosen, Samuel ..... Minneapolis
Rosenberg, E. F. ..... Rochester
Rosenfield, A. B. ..... Pequot
Rosenholtz, Burton ..... St. Paul
Rosenow, E. C. ..... Rochester
Rosenow, E. C., Jr. ..... Rochester
Rosenthal, F. H. ..... Grand Meadow
Rosenthal, Robert ..... St. Paul
Rosenwald, R. M. ..... Minneapolis
Ross, W. P. ..... Worthington
Roth, F. D. ..... Lewiston
Rothrock, J. L. ..... St. Paul
Rothschild, H. J. ..... St. Paul
Rousseau, Victor ..... Maple Lake
Roust, H. A. ..... Montevideo
Rowe, O. W. ..... Duluth
Rowe, W. H. ..... Fairmont
Rowles, E. K. ..... Coleraine
Roy, J. A. ..... Red Lake Falls
Roy, Philemon ..... St. Paul
Rozendaal, H. M. ..... Schenectady, N. Y.
Rucker, C. W. ..... Rochester
Rucker, W. H. ..... Minneapolis
Rud, N. E. ..... Minneapolis
Rudell, G. L. ..... Minneapolis
Rudie, C. N. ..... Kenyon
Rudie, P. S. ..... Duluth
Ruhberg, G. N. ..... St. Paul
Rumpf, C. W. ..... Faribault
Rumpf, W. H. ..... Faribault
Rumpf, W. H. ..... St. Cloud
Rupp, Alice ..... Minneapolis
Russ, H. H. ..... Blue Earth
Russeth, A. N. ..... Minneapolis
Rusten, E. M. ..... Minneapolis
Rutherford, W. C. ..... St. Paul
Rutledge, L. H. ..... Detroit Lakes
Ryan, J. J. ..... St. Paul
Ryan, J. M. ..... St. Paul
Ryan, M. E. ..... St. Paul
Ryan, W. J. ..... Duluth
Rydburg, W. C. ..... Brooten
Rynearson, E. H. ..... Rochester

Sach-Rowitz, Alvin ..... Moose Lake
Sadler, W. P. ..... Minneapolis
Saffert, C. A. ..... New Ulm
Sahr, W. G. ..... Hutchinson
St. Cyr, K. J. ..... Osseo
Saliterman, B. I. ..... Minneapolis
Salt, C. G. ..... Minneapolis
Salter, R. A. ..... Virginia
Samuelson, Samuel ..... Minneapolis
Sanderson, E. T. ..... Minneota
Sanford, A. H. ..... Rochester
Sanford, H. S. ..... Rochester
Sarff, O. E. ..... Virginia
Sarnecki, M. M. ..... St. Paul
Satersmoen, Theodore ... Pelican Rapids
Sather, E. R. ..... Alexandria
Satterlee, H. W. ..... Lewiston
Satterlund, V. L. ..... St. Paul
Saunders, T. S., Jr. ..... Rochester
Savage, F. J. ..... St. Paul
Sawatzky, W. A. ..... Minneapolis
Sawyer, M. H. ..... Rochester
Sax, S. G. ..... Duluth
Schaaf, F. H. K. ..... Minneapolis
Schade, F. L. ..... Worthington
Schaefer, J. F. ..... Owatonna
Schaefer, Samuel ..... Winona
Schaefer, W. C. ..... Minneapolis
Schatz, F. J. ..... St. Cloud
Scheldrup, N. H. ..... Minneapolis
Scherer, C. A. ..... Duluth
Scherer, L. R. ..... Minneapolis
Schimelpfenig, G. T. ..... Chaska
Schlesselman, George ..... Anoka
Schlesselman, J. T. ..... Mankato
Schmidt, G. F. ..... Minneapolis
Schmidt, H. W. ..... Rochester
Schmidt, P. A. ..... Good Thunder
Schmidt, P. G. ..... Cottonwood
Schmidt, W. R. ..... Glencoe
Schmitt, A. F. ..... Minneapolis
Schmitt, S. C. ..... Minneapolis
Schneider, J. P. ..... Minneapolis
Schoch, R. B. J. ..... St. Paul
Scholpp, O. W. ..... Hutchinson
Schons, Edward ..... St. Paul
Schottler, G. J. ..... Dexter
Schottler, M. E. ..... Minneapoils
Schroder, C. H. ..... Duluth
Schuldt, F. C. ..... St. Paul
Schulhof, M. G. ..... Rochester
Schultz, J. A. ..... Albert Lea
Schultz, P. J. ..... Minneapolis
Schulze, A. G. ..... St. Paul
Schussler, O. F. ..... Minneapolis
Schutz, E. S. ..... Mountain Lake
Schwartz, V. J. ..... Minneapolis
Schwyzer, Arnold ..... St. Paul
Schwyzer, Gustav ..... Minneapolis
Scofield, C. L. ..... Benson
Scott, E. E. ..... St. Paul
Scott, F. H. ..... Minneapolis
Scott, H. G. ..... Minneapolis
Searles, P. W. ..... Rochester
Seashore, Gilbert ..... Minneapolis
Seashore, R. T. ..... Duluth
Secord, E. W. ..... Rochester
Seeley, I. F. ..... Northfield
Seham, Max ..... Minneapolis
Seifert, M. H. ..... Excelsior
Seifert, O. J. ..... New Ulm
Sellers, G. K. ..... Motley
Selleseth, I. F. ..... Minneapolis
Senkler, G. E. ..... St. Paul
Senn, E. W. ..... Owatonna
Serkland, J. C. ..... Rothsay
Setzer, H. J. ..... St. Paul
Shaleen, A. W. ..... Hallock
Shannon, S. S. ..... Crosby
Shaperman, E. P. ..... Minneapolis
Shapiro, E. Z. ..... Duluth
Shapiro, M. J. ..... Minneapolis
Sharp, D. V. ..... Minneapolis
Shastid, T. H. ..... Duluth
Shaw, A. W. ..... Buhl
Shedlov, Abraham ..... Fosston
Sheedy, C. L. ..... Austin
Sheldon, W. D. ..... Rochester
Shellman, J. L. ..... St. Paul
Shelver, H. J. ..... Ortonville
Sheppard, Fred ..... Hutchinson
Sheppard, P. E. ..... Hutchinson
Sher, D. A. ..... Cold Spring
Sherman, C. L. ..... Luverne
Sherman, R. V. ..... Thief River Falls
Sherwood, G. E. ..... Kimball
Shillington, M. A. ..... St. Paul
Shimonek, S. W. ..... St. Paul
Shoemaker, Rosemary ..... Rochester
Short, Jacob ..... St. Paul
Shrader, J. S. ..... Jordan
Sibley, W. L. ..... Rochester
Siegmann, W. C. ..... Minneapolis
Silver, J. D. ..... Minneapolis
Simison, C. W. ..... Hawley
Simons, B. H. ..... Chaska
Simons, E. J. ..... Swanville
Simons, J. H. ..... Minneapolis
Simons, L. T. ..... St. Paul
Simons, S. J. ..... Akeley
Simonton, K. M. ..... Rochester
Simpson, E. D. ..... Minneapolis
Simpson, W. C. ..... Rochester
Sinamark, Andrew ..... Hibbing
Singer, B. J. ..... St. Paul
Siperstein, D. M. ..... Minneapolis
Sisler, C. E. ..... Grand Rapids
Sivertsen, Andrew .... Hollywood, Calif.
Sivertsen, Ivar ..... Minneapolis
Sjostrom, L. E. ..... Storden
Skaug, H. M. ..... Chatfield
Skinner, H. O. ..... St. Paul
Skjold, A. C. ..... Minneapolis
Slater, S. A. ..... Worthington
Sloan, Julius ..... Minneapolis
Sloan, L. N. ..... Minneapolis
Slocumb, C. H. ..... Rochester
Slocumb, J. A. ..... Plainview
Slyfield, F. F. ..... Duluth
Smersh, J. F. ..... Owatonna
Smisek, E. A. ..... St. Paul
Smisek, F. M. ..... Minneapolis
Smith, A. E. ..... Minneapolis
Smith, A. M. ..... Minneapolis
Smith, A. M. ..... Thief River Falls
Smith, B. A. ..... Crosby
Smith, B. F. ..... Rochester
Smith, C. H. ..... Rochester
Smith, C. M. ..... Duluth
Smith, F. D. ..... Kasson
Smith, F. L. ..... Rochester
Smith, H. L. ..... Rochester
Smith, H. R. ..... Minneapolis
Smith, L. A. ..... Rochester
Smith, L. G. ..... Montevideo
Smith, M. W. ..... Red Wing
Smith, N. D. ..... Rochester
Smith, N. M. ..... Minneapolis
Smith, W. R. ..... Grand Marais
Snell, A. M. ..... Rochester
Snyder, G. W. ..... St. Paul
Snyder, J. M. ..... Rochester
Soderlind, R. T. ..... Minneapolis
Sogge, L. L. ..... Windom
Sohlberg, O. I. ..... St. Paul
Sohmer, A. E. ..... Mankato
Soine, T. S. ..... Barnesville
Solhaug, S. B. ..... Minneapolis
Solsem, F. N. ..... Sacred Heart
Sommer, A. W. ..... Elmore
Sonnesyn, N. N. ..... Le Sueur
Sorenson, E. M. ..... Tyler
Souster, B. B. ..... St. Paul
Sowers, B. F. ..... Rochester
Spano, J. P. ..... Minneapolis
Sperling, Louis ..... Minneapolis
Spicer, F. W. ..... Duluth
Spittler, R. O. ..... Fort Snelling
Sprafka, J. M. ..... St. Paul
Sprague, R. G. ..... Rochester
Spratt, C. N. ..... Minneapolis
Spurbeck, R. G. ..... Cloquet
Spurzem, C. H. ..... Minneapolis
Spurzem, R. J. ..... Anoka
Stafford, C. E. ..... Hewitt
Stafne, W. A. ..... Moorhead
Stalker, L. K. ..... Rochester
Stangl, Fred ..... St. Cloud
Stangl, P. E. ..... St. Cloud
Stanley, C. R. ..... Worthington
Steenrod, E. J. ..... Rochester
Steffens, L. A. ..... Red Wing
Steffens, L. F. ..... Rochester
Stein, R. J. ..... Pierz
Steinberg, C. L. ..... St. Paul
Steiner, I. W. ..... Winona
Stelter, L. A. ..... Minneapolis
Stenstrom, A. T. ..... Minneapolis
Stephan, E. L. ..... Hinckley
Sterner, E. G. ..... St. Paul
Steube, R. W. ..... Alexandria
Stevens, John ..... Gonvick
Stevenson, B. M. ..... Fulda
Stevenson, C. A. ..... Rochester
Stewart, A. B. ..... Owatonna
Stewart, Alexander ..... St. Paul
Stewart, C. A. ..... Minneapolis
Stewart, Gwendolyn ..... Faribault
Stewart, N. E. ..... St. Cloud
Stewart, R. I. ..... Minneapolis
Stillwell, W. C. ..... Mankato
Stinnette, S. E. ..... St. Paul
Stocking, F. F. ..... Hallock
Stoeckmann, A. E. ..... St. Paul
Stolpestad, A. H. ..... St. Paul
Stolpestad, H. L. ..... St. Paul
Stomel, Joseph ..... Minneapolis
Strachauer, A. C. ..... Minneapolis
Strand, E. V. ..... Bayport
Strate, G. E. ..... St. Paul
Strathern, F. P. ..... St. Peter
Strathern, M. L. ..... Gilbert
Stratte, A. K. ..... Pine City
Stratte, H. C. ..... Windom
Strobel, W. G. ..... Duluth
Strout, E. S. ..... Minneapolis
Strout, G. E. ..... Minneapolis
Stuart, A. B. ..... Cloquet
Stuhler, L. G. ..... Rochester
Stuhr, J. W. ..... Stillwater
Sturre, J. R. ..... Minneapolis
Stuurmanns, S. H. ..... Erskine
Sukeforth, L. A. ..... Duluth
Sullivan, R. M. ..... Minneapolis
Sundt, Mathias ..... Minneapolis
Sutherland, C. G. ..... Rochester
Sutherland, H. N. ..... Ely
Sutton, C. S. ..... St. Cloud
Sutton, H. R. ..... Hoffman
Swanson, Cephas ..... Minneapolis
Swanson, J. A. ..... St. Paul
Swanson, P. E. ..... Virginia
Swanson, R. E. ..... Minneapolis

Swedenburg, A. W...Thief River Falls
Swedenburg, P. A...Pawnee, Nebraska
Sweetser, H. B. Jr.....Minneapolis
Sweetser, H. B. Sr.....Minneapolis
Sweetser, T. H.....Minneapolis
Sweitzer, S. E.....Minneapolis
Swendseen, C. G.....Minneapolis
Swendson, J. J.....St. Paul
Swensen, R. G.....Harris
Swenson, A. O.....Duluth
Swenson, O. J.....Waseca
Swezey, B. F.....Buffalo
Swingle, H. F. Jr.....Rochester
Sybilrud, H. W.....Bricelyn

Tangen, G. M.....Canby
Tanglin, W. G. L.....Mahnomen
Tanquist, E. J.....Alexandria
Taylor, C. W.....Duluth
Taylor, J. H.....Minneapolis
Teem, M. Van B.....Rochester
Teisberg, C. B.....St. Paul
Telford, V. J.....Litchfield
Tennison, W. J. III.....Rochester
Ternstrom, O. H.....Minneapolis
Thabes, J. A. Jr.....Brainerd
Thabes, J. A. Sr.....Brainerd
Thayer, E. A.....Truman
Thomas, G. E.....Minneapolis
Thomas, G. H.....Minneapolis
Thomas, G. J.....Minneapolis
Thompson, Albert.....St. James
Thompson, Arthur.....Cokato
Thompson, F. A.....St. Paul
Thompson, G. J.....Rochester
Thompson, H. H.....Minneapolis
Thomson, J. M.....Brownsdale
Thordarson, Theodore.....Minneota
Thoreson, M. O.....St. Paul
Thorson, E. O.....Luverne
Thorson, O. P.....Northfield
Thysell, F. A.....Moorhead
Thysell, V. D.....Hawley
Tibbetts, M. H.....Duluth
Tierney, C. M.....Harmony
Tifft, C. R.....St. Paul
Tilderquist, D. L.....Duluth
Tillisch, J. H.....Rochester
Tingdale, A. C.....Wayzata
Tinker, C. W.....Stewart
Tofte, Josephine.....Minneapolis
Torgerson, W. B.....Oklee
Traeger, C. A.....Faribault
Traxler, F. J.....Henderson
Tregilgas, H. R.....South St. Paul
Troost, H. B.....Mankato
Trueman, H. S.....Minneapolis
Trutna, T. J.....Silver Lake
Tunstead, H. J.....Minneapolis
Tuohy, E. B.....Rochester
Tuohy, E. L.....Duluth
Turnacliff, D. D.....Minneapolis
Tweedy, G. J.....Winona
Tweedy, R. B.....Winona
Tyrrell, C. C.....Minneapolis

Ude, W. H.....Minneapolis
Ulrich, H. L.....Minneapolis
Undine, C. A.....Minneapolis
Urberg, S. E.....Duluth

Vaaler, T.....Cannon Falls
Vadheim, A. L.....Tyler
Vail, J. B.....Henning
Valentine, W. H.....Tracy
Vandersluis, C. W.....Bemidji
Van Meier, Henry.....Stillwater
Van Slyke, C. A.....St. Paul
Vaughan, V. M.....Truman
Veirs, Dean.....St. Paul
Veirs, Ruby S.....St. Paul
Venables, A. E.....St. Paul
Vercellini, C. E.....Duluth
Vezina, J. C.....Mapleton
Vik, A. E.....Minneapolis
Vik, Melvin.....Onamia
Virnig, M. P.....Wells
Vogel, H. A. L.....New Ulm
Vogel, J. H.....New Ulm
Von der Weyer, William.....St. Paul

Waas, C. W.....St. Paul
Wagener, H. P.....Rochester
Wahlberg, E. W.....Isle
Wahlquist, H. F.....Minneapolis
Walch, A. E.....Minneapolis
Waldron, C. W.....Minneapolis
Walfred, K. A.....St. Cloud
Walker, A. E.....Duluth
Walker, A. E.....St. Paul
Walker, G. H.....Winona
Wall, C. R.....Minneapolis
Wallace, M. O.....Duluth
Waller, J. D.....Wilmont
Walsh, M. N.....Rochester
Walter, C. W.....St. Paul
Walters, Waltman.....Rochester
Wangensteen, O. H.....Minneapolis
Wanous, E. Z.....Minneapolis
Ward, A. W.....Minneapolis
Ward, C. E.....Rochester
Ward, P. A.....Minneapolis
Warham, T. T.....Minneapolis
Warnock, R. W.....St. Paul
Warren, C. A.....St. Paul
Warren, E. L.....St. Paul
Warren, F. S.....Washington, D. C.
Washburn, R. N.....Rochester
Watkins, C. H.....Rochester
Watson, A. M.....Royalton
Watson, C. G.....Soudan
Watson, J. A.....Minneapolis
Watson, J. D.....Holdingford
Watson, P. T.....Cass Lake
Watson, W. J.....Holdingford
Watz, C. E.....St. Paul
Waugh, J. M.....Rochester
Webb, R. C.....Minneapolis
Webber, E. E.....Duluth
Weber, H. M.....Rochester
Webster, L. J.....Ah-Gwah-Ching
Weir, J. F.....Rochester
Weiser, G. B.....New Ulm
Weisman, S. A.....Minneapolis
Welch, C. S.....Rochester
Welch, M. C.....St. Paul
Wellbrock, W. L. A.....Rochester
Wells, A. H.....Duluth
Wells, W. B.....Sherburn
Wenner, W. T.....St. Cloud
Wentworth, A. J.....Mankato
Werner, O. S.....Cambridge
Wesson, H. R.....Rochester
West, E. J.....Duluth
Westby, Magnus.....Madison
Westby, Nels.....Madison
Westerman, A. E.....Montgomery
Westerman, F. C.....Montgomery
Westman, R. T.....Minneapolis
Wethal, A. G.....Minneapolis
Wetherby, Macnider.....Minneapolis
Weum, T. W.....Minneapolis
Wheeler, D. W.....Duluth
Wheeler, M. W.....St. Paul
Whitacre, J. C.....St. Paul
White, A. A.....Minneapolis
White, S. M.....Minneapolis
White, W. D.....Minneapolis
Whitesell, L. A.....Minneapolis
Whitmore, Frank.....St. Paul
Whitson, S. A.....Alden
Whittaker, L. D.....Rochester
Widen, W. F.....Minneapolis
Wiechman, F. H.....St. Cloud
Wiese, H. F. B.....Minneapolis
Wilbur, D. L.....Rochester
Wilcox, A. E.....Minneapolis
Wilder, R. L.....Minneapolis
Wilder, R. M.....Rochester
Wilken, P. A.....Minneapolis
Wilkinson, Stella L.....Duluth
Wilkowske, R. J.....Nerstrand
Will, W. W.....Bertha
Willcutt, C. E.....Minneapolis
Williams, A. B.....St. Paul
Williams, C. A.....Pipestone
Williams, C. K.....St. Paul
Williams, D. H.....Rochester
Williams, H. L. Jr.....Rochester
Williams, H. O.....Lake Crystal
Williams, L. A.....Slayton
Williams, M. R.....Cannon Falls
Williams, Robert.....Minneapolis
Williams, R. V.....Rushford
Williamson, G. A.....St. Paul
Willius, F. A.....Rochester
Wilmot, C. A.....Grand Rapids
Wilmot, H. E.....Litchfield
Wilson, C. E.....Blue Earth
Wilson, J. A.....St. Paul
Wilson, J. V.....St. Paul
Wilson, L. B.....Rochester
Wilson, R. H.....Winona
Wilson, Warren.....Northfield
Wilson, W. E.....Northfield
Wilson, W. F.....Lake City
Wiltrout, I. G.....Oslo
Windsor, R. L.....Fergus Falls
Winer, L. H.....Minneapolis
Wingquist, C. G.....Carlton
Winnick, J. B.....St. Paul
Winter, J. A.....Duluth
Winther, Nora.....Minneapolis
Witham, C. A.....Minneapolis
Withrow, M. E.....International Falls
Wittich, F. W.....Minneapolis
Wohlrabe, A. A.....Minneapolis
Wohlrabe, C. F.....Minneapolis
Wohlrabe, E. J.....Springfield
Wold, K. C.....St. Paul
Wolfe, H. H.....St. Paul
Wolff, H. J.....St. Paul
Wolff, L. H.....Rochester
Wolfram, D. J.....Rochester
Wolner, O. H.....St. Peter
Woltman, H. W.....Rochester
Wood, G. H.....Rochester
Wood, H. G.....Rochester
Woodruff, C. W.....Chatfield
Woodworth, Elizabeth.....Minneapolis
Woodworth, L. F.....Le Center
Workman, W. G.....Tracy
Wray, W. E.....Campbell
Wright, C. B.....Minneapolis
Wright, C. D.....Minneapolis
Wright, C. O.....Luverne
Wright, F. R.....Minneapolis
Wright, S. G.....Minneapolis
Wrork, D. H.....Rochester
Wunder, H. E.....Shakopee
Wyatt, O. S.....Minneapolis
Wylie, A. R. T.....Faribault
Wynne, H. M. N.....Minneapolis

Yaeger, W. W.....Ivanhoe
Yeager, C. L.....Rochester
Ylvisaker, R. S.....Minneapolis
Yoerg, O. W.....Minneapolis
Young, H. H.....Rochester
Young, T. O.....Duluth
Young, V. A.....Duluth
Younger, L. I.....Winona
Youngren, E. R.....St. Paul

Zachman, A. H.....Melrose
Zander, C. H.....St. Paul
Zaworski, E. A.....Minneapolis
Zemke, E. E.....Fairmont
Zide, H. A.....Rochester
Zierold, A. A.....Minneapolis
Zimmermann, H. B.....St. Paul
Ziskin, Thomas.....Minneapolis
Zlatovski, M. L.....Duluth